JANUARY, 1954

Products finishing

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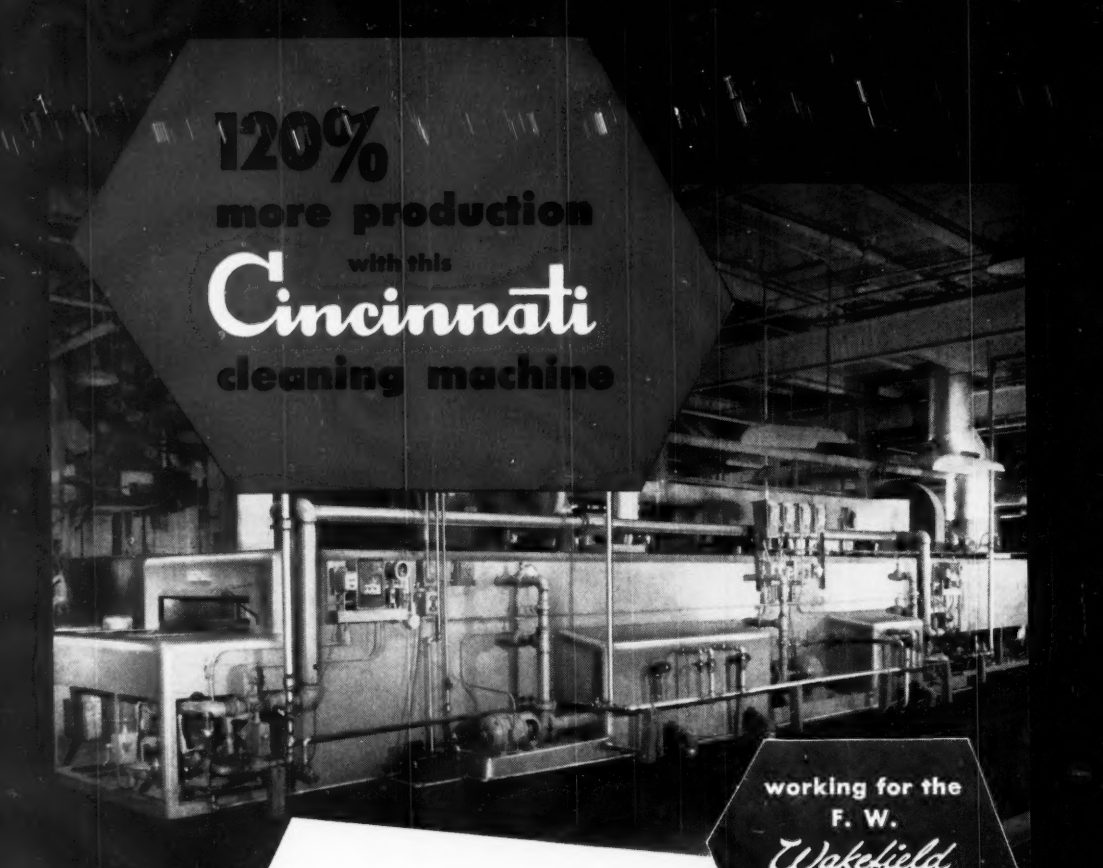

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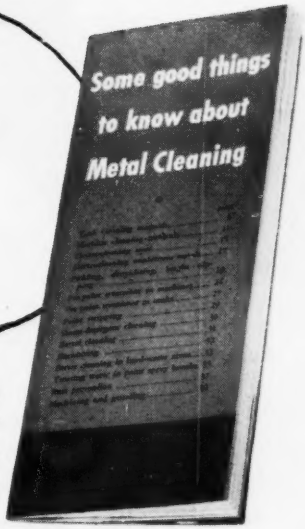

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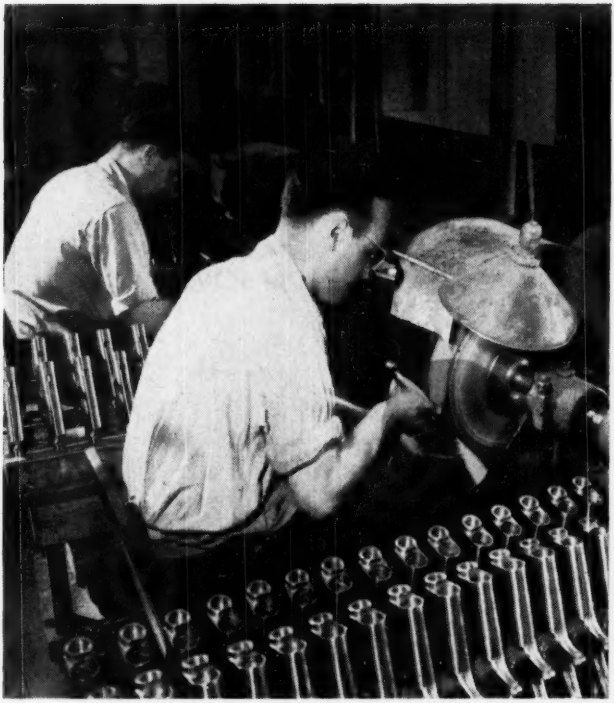

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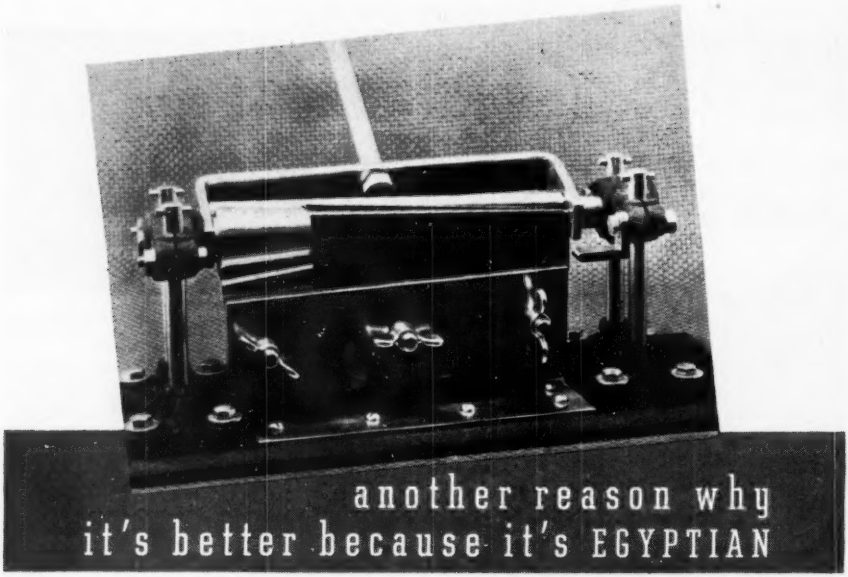

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VOLUME 18 NUMBER 4 JANUARY, 1954

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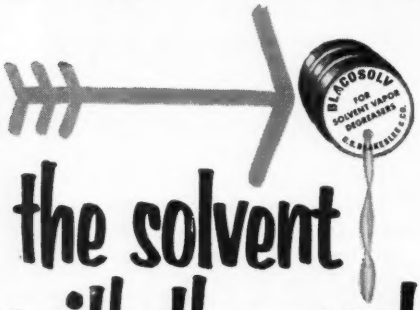

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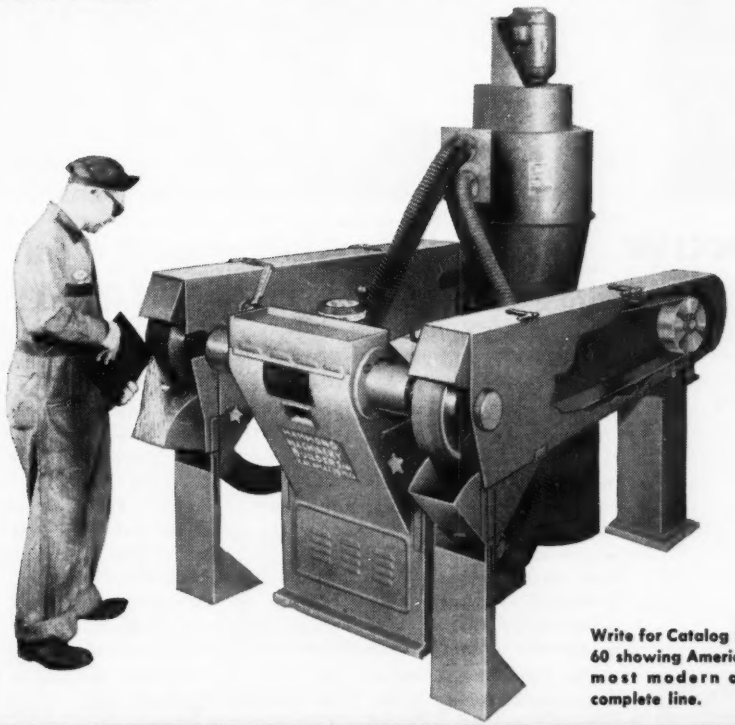

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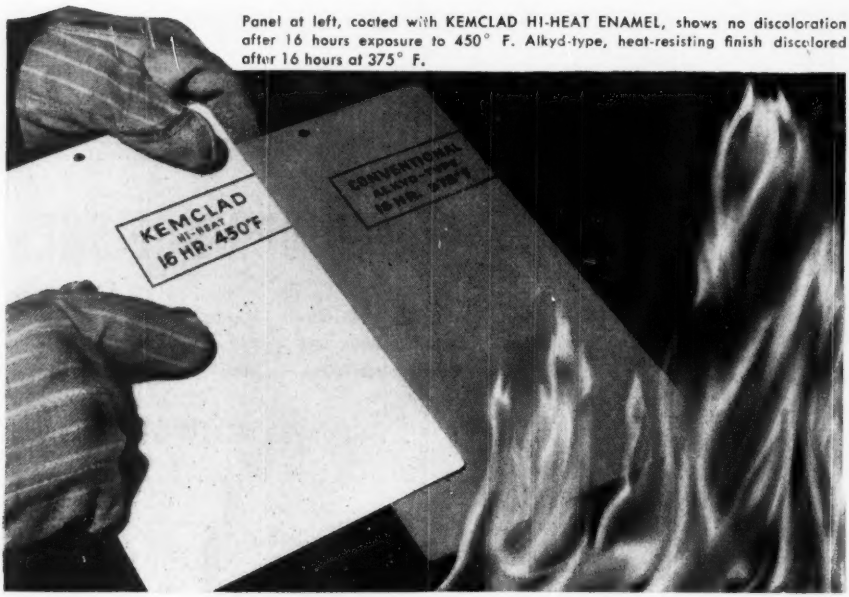

Panel at left, coated with KEMCLAD HI-HEAT ENAMEL, shows no discoloration after 16 hours exposure to 450° F. Alkyd-type, heat-resisting finish discolored after 16 hours at 375° F.

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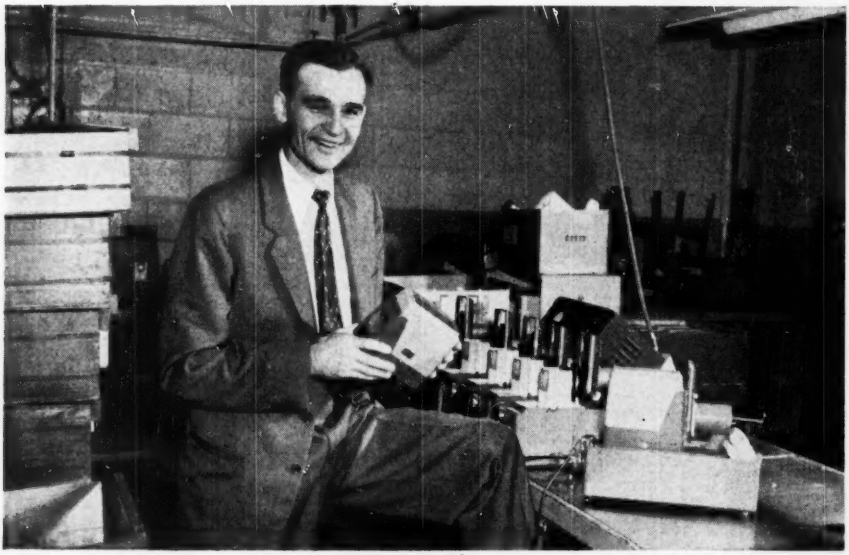
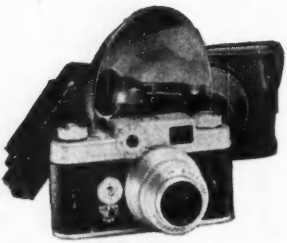
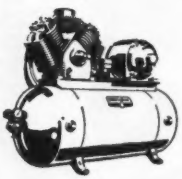


20% DROP IN REJECT RATE — *Small wonder Ralph Parsons, Foreman of the Paint Shop at Argus Cameras, Inc., is pleased as he examines the lamp housing from one of the new "300" projectors. The rich, wrinkle finish is applied with DeVilbiss spray equipment.*



20% SAVINGS IN SPRAY MATERIAL *on this beautiful Argus C-Four.*



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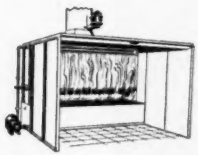

Spray Booths

year in painting single camera part

Argus Cameras works with DeVilbiss Production Service to increase production, reduce rejects, save time and material

Argus Cameras, Inc., Ann Arbor, Michigan, is well known as one of America's leading manufacturers of fine camera equipment. Recently, starting production on their new "300" projector, they found unit labor costs and rejects were running too high in the paint shop.

Argus called in DeVilbiss Production Service. An on-the-job analysis of the entire Argus painting operation was made and specific recommendations for improvement were given. The results were eye opening:

> A savings of $1,660 a year on direct labor cost for painting a single camera part. A savings of 48% in actual spraying time on another part. A savings of up to 20% in spray material for individual parts. A drop in rejects of 20% on the projector lamp housing.

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A well known plant has been operating a tank of Unichrome Nickel alongside another type of bright nickel—both plating automotive and plumbing parts. Despite the fact that this other bath was a considerably larger installation, Unichrome Nickel turned out more work. Reason? Unichrome Nickel required fewer purification treatments—usually kept right on working while the other bath was shut down for purification. Unichrome Bright Nickel has now been installed in the larger tank.

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his development of the United Chromium aboratories has simplified operations and educed costs for the many companies us- ig it.

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With excellent tolerance for impurities and simple control, the Unichrome Bright Nickel solution is easily kept in prime plating condition. That means sustained brilliance of deposits, high rate of brightening, good leveling, and wide bright plate range.

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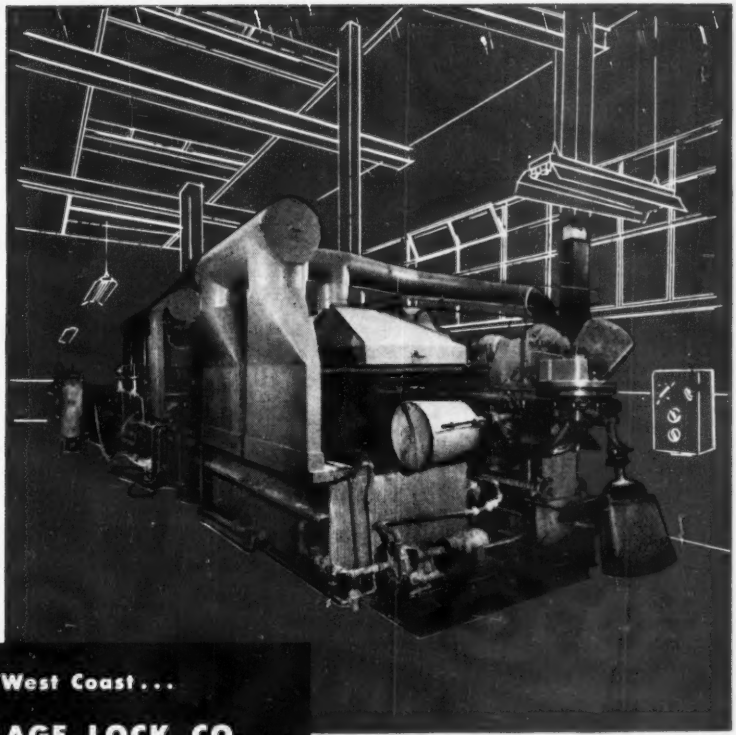

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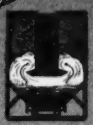

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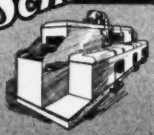

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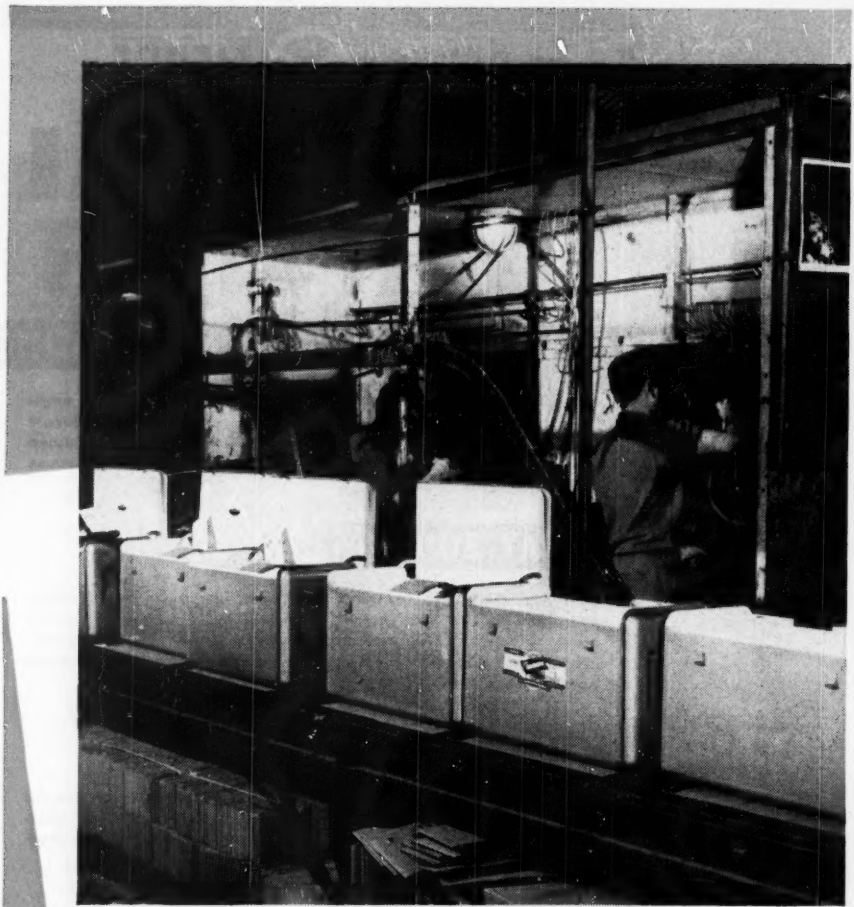

• Poloron's Therma..ter Portable Refrigerators pass through spray painting booths where they are sprayed with Pittsburgh's Hammerhide Finishes on the exterior. Interiors are finished with gleaming, blue-white baked enamel. Poloron also produces a Woodland model which has Pittsburgh Wrinkle Finish on the exterior.

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Picnic Products by Poloron

Are Protected with Attractive

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Special Polychromatic Enamels and Wrinkle and Hammerhide Finishes give these portable units added beauty and longer life

● **Since 1928,** Poloron Products, Inc., of New Rochelle, N. Y., has manufactured picnic ice boxes, vacuum jugs and other outdoor items to meet the needs of millions of vacationing and picnicking Americans.

● **Pittsburgh Finishes** have proved ideal in making these unusual products look better and last longer.

● **Poloron's** Thermaster Portable Refrigerators are sprayed with Pittsburgh Hammerhide Finishes. Interiors are finished with gleaming, blue-white baked enamel. Its Woodland model has Pittsburgh Wrinkle Finish on the exterior.

● **Poloron** also produces Woodland feather-weight vacuum jugs in one- and two-gallon sizes, as well as one-gallon Thermaster bottles. The Woodland jugs are sprayed with Pittsburgh's Green Polychromatic Enamel and the Thermaster bottles are coated with Gray Hammerhide Finish.

PITTSBURGH PLATE GLASS CO., Industrial Paint Div., Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Atlanta, Ga.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Div., Detroit, Michigan. The Thresher Paint & Varnish Co., Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Div., Pittsburgh, Pa.

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Poloron Products, Inc., is just one of the many manufacturers with whom Pittsburgh's technical staff has worked to develop highly specialized finishes. This broad experience may be helpful in saving you time and money. Write, wire or phone the Pittsburgh Paint plant nearest you. We'll be glad to have one of our engineers discuss your finishing problems with you at no cost or obligation.

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NOTE *There is more information on LP Cleaner in this booklet. Send for it!*

Pf editorial

JANUARY, 1954

Vol. 18, No. 4

How's Business?

Your answer to that often-asked question, "How's business?," may be influenced by which of the many state-of-business surveys you have read most recently. However, some factors affecting business in the Finishing Industry, discussed recently by a manufacturer of finishing supplies, contain so much common sense and are so generally applicable that they are well worth review and comment.

In order that your business will prosper this year, or any year, you should give serious attention to the following suggestions:

1. MAKE A GOOD PRODUCT. No one today questions the necessity of manufacturing a quality product. In fact, many competitive products tend to approach the same high quality level, and many times the only competitive "edge" is a more attractive or durable finish. That point emphasizes the strategic position of the Finishing Industry in the industrial picture.

2. KNOW YOUR BUSINESS. Know your product, your market and the best ways for you to sell your products or services. No matter how good your product is, if you don't analyze your market so that you can take advantage of proper distribution and merchandising aids, to get your message to your customers and prospects, you will not be able to compete.

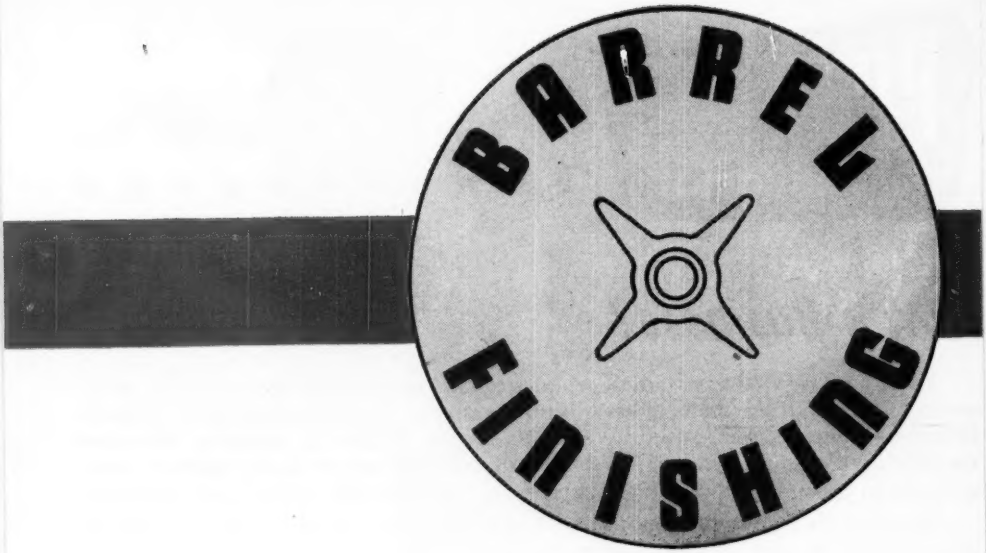
3. GIVE GOOD SERVICE. There is no easier person to sell than a satisfied customer. One of the best ways to create satisfied customers is to show sincere concern for their problems. Make an extra effort to show them how to use your product properly. If they have trouble, be on hand to help them work out of it.

4. WORK HARD. Science still has not developed a satisfactory substitute for either experience or hard work. Whether you are selling services as a job finisher or finishing technician, selling buffing compounds, paint, plating tanks, or conveyorized finishing systems, your effectiveness will be in proportion to the kind and amount of personal effort you put forth. Your success as a supplier to the Finishing Industry will depend on the effort you devote to developing good products and showing your customers how to use them profitably, and on the industry contacts you make either personally or through the members of your organization.

Build a good product; employ distribution and selling aids, such as advertising; give good service; work hard. Then, for you, 1954 will be a good year.

Ezra A. Blount

—EDITOR



The Use of a Slurry in Barrel Finishing.

TIMES without number barrel operators have asked us, "How in the world do they get the beautiful, lustrous finishes on steel balls and various steel shapes used in barrel finishing procedure?" The answer is that this result is obtained by the use of a "slurry."

Any finely divided mineral or combination of minerals reduced to an almost impalpable powder and mixed with either oil, grease or soap will constitute a sludge.

Any finely divided mineral or combination of minerals reduced to an almost impalpable powder and mixed with water only, will constitute a slurry.

An impalpable powder might be described as a material that has been ground so fine that no gritty sensation will be perceptible to the touch, and this might well indicate material that has been ground to a mesh fineness of 0.0002 inch.

Steel barrel finishing materials are formed, and then barrel operated with a variety of materials such as sharp sand, emery, or any of the aluminum oxide abrasives, for the purpose of reducing the surface area to an even plane prior to any heat treating operations. Following heat treating, the materials are again barrel processed with the same materials listed above until a soft, smooth matte finish is produced. In this latter processing all scale left from the heat treating process is removed. At this stage we are ready for the final or "slurry" finish.

Vienna Lime Slurry

The materials are placed in an appropriate barrel (generally the high and narrow type), the load is leveled off, and water is added to a depth

# of Metal Products

By H. LEROY BEAVER
Beaver Barrel Finishing Research
Lansdale, Pennsylvania

of about one inch over the load mass. The number of gallons of water added to the barrel is carefully checked, and for each gallon of water there is then added from 1 to 1½ pounds of Vienna Lime, and the barrel is placed in operation.

The procedure for finishing hardened steel burnishing materials is identical with that used in the final finishing or polishing of steel balls for radial and thrust bearings, but the high degrees of accuracy required in the latter are not necessary in the former. Generally from 0.00005 to 0.000075 inch of material is removed in this slurry finishing, but the abrasive action of the Vienna Lime is so restrained, due to its softness, that from 16 to 20 hours of continuous operation is required to remove this very small amount of metal.

On the completion of this phase of the operation, the slurry is drained off, the barrel flushed out, a new charge of water and a small quantity of 42-titer soap added. After a run of about ten minutes the barrel is emptied and the materials dried in oblique tilting wood barrels with some one of the conventional drying materials. The whole procedure is just as simple to perform as the above description indicates.

In operating a Vienna Lime slurry in a closed type of barrel, the barrel must be adequately vented. Vienna Lime operated in water generates heat which causes an increased air pressure inside the barrel. If the barrel is not vented, a considerable whitewash spray may be released when the barrel lid is removed. If your barrel has no vent, then the lid should be eased off slightly at regular intervals to permit the escape of the heated air.

During the fourteen years in which we were directly concerned with the production of steel balls for bearings we became familiar with a

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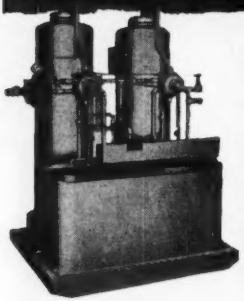
WATER DEMINERALIZERS



Mill Room Water
Nickel Dip Solutions
Neutralizer Solutions

Cost analyses are proving that the use of raw water in metal coating processes is not so cheap after all. This is especially true when mineral-free water can be obtained for a matter of cents per 1000 gallons in any quality with an INDUSTRIAL water demineralizer.

The operation is very simple. Raw water is passed through alternate beds of ion-exchange resins, and it comes out free of all mineral salts. No steam, heat, still, or cooling water is needed—keeping space requirements at a minimum.

It's simple to get the complete facts for your case. Send us a water analysis and let us know how much water you have to treat and the gallons per hour needed. We can then give you the whole demineralizer story including estimated costs, equipment required, performance data, etc., for your requirements.

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considerable number of materials that might well be applied to surface treatment of metals in the form of operating slurries. Vienna Lime, in the early days of steel ball production in this country, was imported from Austria, which may account for the designation Vienna Lime. This name has always been applied to certain lime especially prepared for barrel finishing application. We became familiar with limes from various other sources, but we found that the finest Vienna Lime had its source in the area surrounding Manitowoc, Wisconsin. Of these limes, a brand known as "Allwood" met every test requirement, and this is the brand we use in all of our experimental research work where a lime finish is indicated.

Dimensional accuracy has been characteristic of slurry finishing for many years. As long as thirty years ago, samples of steel balls for bearings submitted for tests to The National Bureau of Standards showed accuracies of five millionths of an inch in sphericity, and easily within 0.000025 inch in diameter. Balls of such a high degree of accuracy are not generally required, and the ones usually specified as first grade are only required to be within 0.00001 inch in diameter and sphericity, a degree of accuracy very easily obtainable through slurry finishing.

We have often wondered why manufacturers of many lines of materials fabricated from steel did not use this method of barrel finishing to produce a highly lustrous finish on the products. Such parts could be operated in most any conventional barrel along with highly polished, hardened steel barrel finishing ma-

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terials, and the resulting finish would be the same on the steel parts as on the burnishing materials themselves.

If you are a manufacturer of parts such as we have described, and if you want to see what such parts would be like when treated in this way, perhaps we can prevail upon some of our friends who manufacture steel barrel finishing materials to process a few parts for you. Your soft steel parts would be initially processed for smoothness, then put through a case hardening process, and finally finished in a lime slurry exactly as are steel barrel finishing materials. It is altogether possible that you might favor this method of adding attractiveness to your product, and that you might consider adopting barrel finishing procedure. Just write to us if you are interested, and we will try to work it out for you.

In the definition of a slurry you will recall that we mentioned "any mineral or combination of minerals." This phrase referred to various types or blends of clays. Certain of our native clays possess valuable detergent properties; for example, the clays found in the Benton group. The slurries composed from materials of this type are inert or inactive as respects their chemical composition, and they do not chemically affect the surface of the metals which they contact.

A slurry of such finely divided minerals, when operated with water, seems to be able to take up and hold in suspension any unwanted dirt, grease or oil that might be present

FLAT OR CONTOURED PRODUCTS SURFACE FINISHED WITH PRECISION

Wrenches, pliers, screw drivers, ax heads and other hand tools are surface finished most efficiently on this machine. It is designed for either magnetic or mechanical holding fixtures.

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Specialized Machine Equipment For Glazing and Polishing Operations
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Products Finishing or Plating?

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Cut Costs . . .
Build Quality

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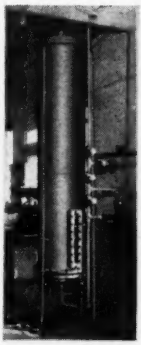
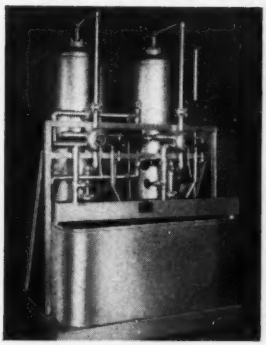
Barnstead Demineralized Water

3 types of installations to choose from



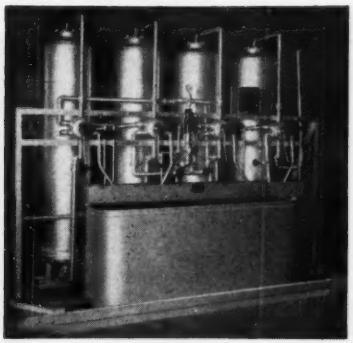
MIXED-BED

Mixed-Bed Unit provides 500 gal/hr pure water for finishing electrical components.



TWO-BED

Two-Bed Unit supplies 1000 gal/hr of pure water for chromium-plating solutions in automotive plant.



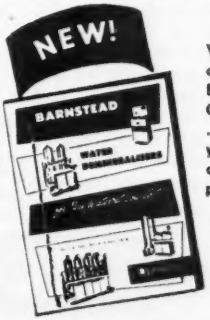
FOUR-BED

Four-Bed Unit with 80 gal/hr output produces pure water for anodizing.

In rinsing, plating, anodizing, and make-up — wherever pure, mineral-free water is a necessity — Barnstead Demineralized Water can save you money by cutting down on rejects, increasing quality and volume.

Cost is extremely low — as little as 5c per 1000 gallons. Installation is quick and easy. Since unit is shipped complete and ready to operate, there are no on-the-job assemblies.

From Barnstead, you get the benefit of more than 75 years' continuous experience in water purification. Recommendations and quotations to you entirely without obligation.



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on the parts. Hence, when the operation is completed, such residual soil is not redeposited on the surface of the parts in the unloading process, but is washed away as the parts are rinsed after being unloaded.

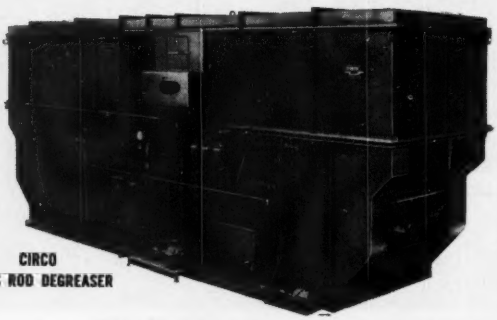
How To Use Slurries

Many operators feel that a slurry should be discarded after each load of material is completed, but experience has shown that this is not at all necessary. When the operation is completed, the major part of the slurry can be drained off and returned to the barrel for use on succeeding loads of parts. Only the thin film of slurry left on the parts is lost. In one plant where we introduced slurry finishing, the slurry is a pearl gray at the start, but it is used over and over again until it is more nearly black. It is just as effective after use as on its initial operation. The fact is that you cannot wear out your slurry. Vienna Lime is the exception, and this item is generally discarded after each operation. With the non-wear-out slurries, you simply add more slurry material so as to keep the consistency of the slurry at about that of table cream.

Suspending Abrasive Materials

Down through the years much thought has been given to the suspending of abrasive materials in the mass within a burnishing barrel so that the parts being processed might

Circo Vapor Degreasers use 30% less solvent



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New, modern Circo vapor degreasers — whether large or small — are engineered to save on solvent consumption. Construction features like balanced condensing coils, leak-proof pumps and dual vapor-level control are today saving companies 30% and often more in solvent use. Circo degreasers perform faster, save precious man-hours through engineering designs developed through 30 years experience in vapor degreasing.

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Write for details on the most modern, talked about metal cleaning development of the century—the Circosonic degreaser that cleans small metal parts by the power of sound.

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Engineered Equipment
Complete Finishing Systems designed, fabricated and installed by DESPATCH are engineered to meet your specific finishing problems. Your every requirement is given full consideration by competent DESPATCH engineers with the ultimate result that you have a system that will produce top quality finishes on your products at the lowest possible operating and maintenance costs.
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always be under the action of the abrasive. We have commented on this at various times, and also have described the materials we used to maintain this abrasive suspension.

The problem of maintaining abrasive materials in suspension is a real one. The specific gravity of water is 1.0, and since just about every abrasive used in barrel finishing is greater than that, water is not a satisfactory suspending medium. Oil is objectionable because it becomes hidden under scratches, is driven into pores in the metal, and is most difficult to remove. A capable mechanic does not resort to the oil can to lubricate his files if he wants to remove surface area effectively, and for the same reason we should not resort to oil as a suspending medium for abrasives in barrel finishing.

An appropriate slurry will do all that might be required in the matter of holding abrasive materials in suspension. It does more than that, because when crushed minerals are used, the scratches should be held down to as fine a degree as possible; and if an appropriate slurry material is used in conjunction with the mineral particles, it will be found that a much softer matte finish will result than anything that could be secured by the use of minerals alone. If the parts have been initially processed with minerals and require a further barrel operation with steel materials and soap solution, then this soft matte will respond far more rapidly to the final bright finish. Where the problem is one of holding abrasive materials in suspension, it can be accomplished more easily by their addition to a slurry than in any other way we have been able to develop.

Many metal products are processed in cast iron barrels. Abrasive materials cut away part of the barrel itself while they are acting on the materials in process. This liberates a certain amount of free graphitic carbon present in all cast iron, and this deposits a carbon smut on the surface of the parts which is generally most difficult to remove. With a slurry to hold the abrasive in suspension, this trouble will not be experienced because, as we have noted, the slurry itself will take up and hold this carbon smut in suspension, in addition to other unwanted elements of residual soil. The metal parts will come from the barrel clean and ready, after a simple cleaning operation, for plating or for the application of lacquer or paint or any other final surface finish. If you wish to try some experiments with slur-

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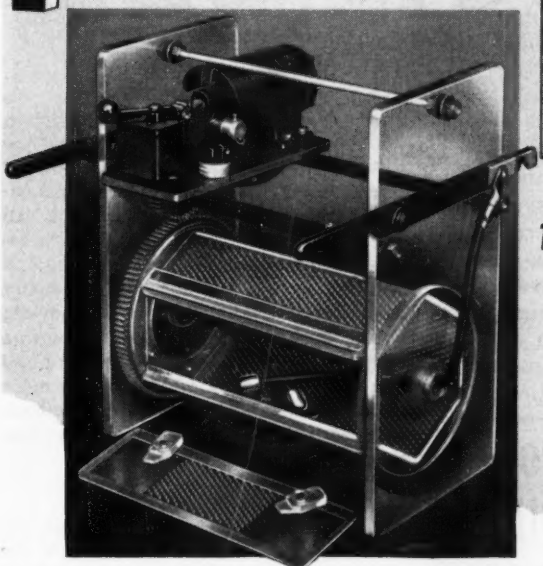
New LUCITE PORTO-PLATER



only $167.50

with 9x15" O.D. Cylinder
115 V, 60 C, 1 Ph. Motor

also
14x30 and 14x36 Plating Barrels and full Barrel Cycle Lines at very reasonable prices!

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Features of Model SPX Porto-Plater

Notched "V" Cathode Contact fits Cathode Rod at any point on the rod.

Complete Lucite End Plates — Support plater — protect cylinder and mechanism in handling.

Reversing Switch with self-contained motor drive —Motor turns cylinder in either direction and holds positively for loading and unloading.

Obstruction-free Cylinder—One-piece molded High Temperature Lucite shell welded to cylinder ends. No ribs, no tie rods, no crevices.

Attached Lucite Cover Locks — Always on the cover. Never misplaced or dropped in tank.

Ball Contact with one-piece dangler cable.

High Temperature Lucite—Cylinder, cover, cover locks, hangers, gears and bushings.

Cylinder perforations 3/32" unless specified.

Cylinder, O.D. 9x15"; I.D. 6x12".

Weight Empty, 28 lbs. Plating Capacity, ¼ peck.

Geared head motor, 1/50 HP, 115 V, 60 C, 1 Ph.

BIGGEST VALUE ever produced in a LUCITE PORTO-PLATER

New features and low price, made possible by BELKE BIG VOLUME PRODUCTION, add up to TREMENDOUS VALUE far greater than ever before obtainable.

A flood of orders in excess of production has created a big backlog with extended delivery dates.

To avoid disappointment, please order well in advance of your needs. Deliveries must be scheduled on the basis of first come first served.

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ries in your own plant, perhaps we can secure slurry material for you.

Even though you might not be interested in slurries, and if you regularly use hardened and polished steel balls or burnishing shapes, you might find that, due to hard water conditions, you are gradually accumulating a film of insoluble lime soap on your steel materials. This is not desirable for the best burnishing results, and if you should have an unlined metal barrel as a part of your equipment, it might be well to operate your burnishing materials with a Vienna Lime treatment substantially as we have described its use in the beginning of this discussion. Such an operation would remove all films, and if there have been some areas of rust on the materials, the operation will round off all edges that might have a marring effect on the parts in process and will recondition your steel materials to an almost new condition.

If you have asked for samples as we suggested in September, you will have already received your samples of typical barrel finishing slurries.

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DETROIT "HANDY TAC" RAG
NON INFLAMMABLE
Detroit Handy "Tac" Rags remove all dust, lint and sand particles. Save time and materials. Avoid costly rejects. Ready for instant use. Never dry out or harden.
Order today from your supplier or send for sample
Standard of the FINISHING INDUSTRY Since 1934
DETRO MFG. & SALES CO., CULVER CITY, CALIFORNIA

The Masters' Electro-Plating Association, Incorporated, advises that there are 2,700,000 vending machines in operation throughout the country. It is one of the fastest growing industries in the United States today. According to the enthusiasts, who claim these machines will sell anything from a breath of oxygen to remove liquor smell to a packdged meal, it will be almost as big as the auto industry some day. But whether it grows that big or not, each machine has a considerable number of plated parts. And as more and more are built they will be made more attractive in order to catch the customer's eye. That will mean more plating per machine.

The output of nickel by International Nickel, world's largest producer, over the past quarter century has risen from about 65,000,000 to approximately 250,000,000 pounds annually.

An accelerated test for plated coatings which will be superior to tests presently used and which can be correlated with service exposure is the goal of the A.E.S. Research Project 15.

The first part of the project is to establish a bench mark for checking various accelerated tests and, toward this end, Detroit taxicabs will be used to determine exposure of plated panels attached to their front license plate brackets. A large number of duplicate panels will be held for use in developing the accelerated tests after the results are known.

(Courtesy of Stevens Technical Newsletter.)

Specify Iridite . . . to meet military specs for corrosion protection during use or storage . . . for paint adherence . . . for low cost color coding . . . or to add quality and sparkle to your products. Here's how you can use Iridite:

ON ZINC AND CADMIUM you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.

ON COPPER . . . Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.

ON ALUMINUM Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.

ON MAGNESIUM Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

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Coating and Forming Aluminum Awning Panels

THE metal awning industry has expanded rapidly since the end of World War II. Prior to the war, annual sales were $300,000. In 1950, total sales rose to a value of $20,000,000.

Arrow Metal Products Corp., Haskell, N. J., one of the leaders in the metal coating field, originally set up pre-coating facilities for the venetian blind industry in the early forties. When, at the end of World War II, aluminum became available and important as a metal awning material, Arrow developed special techniques for coating the metal for the awning field.

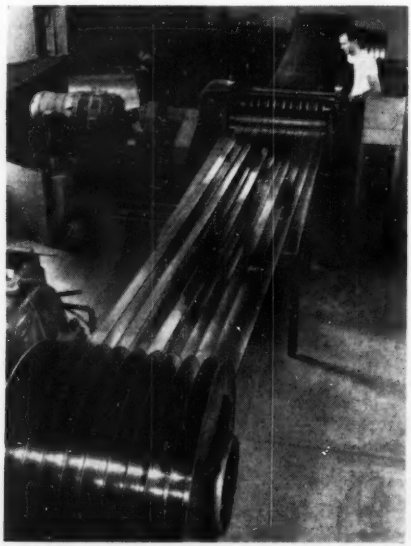

Fig. 1—The start of the coating process at Arrow. Mill coils are slit down to the desired strip widths with absolute uniformity on a large slitter.

This company produces either coiled aluminum stock, or formed flat stock, cut to specification size and finish coated ready for installation or further forming by the awning manufacturer. First step in the process is the slitting operation (Fig. 1) in which coiled aluminum stock is slit to the specified width, and recoiled for further processing.

The coiled aluminum is next fed through an automatic Alodizing* machine (Fig. 2) in which the metal is alkali cleaned, rinsed, and coated with a complex fluorophosphate coating to serve as a bond for the final paint finish and resist corrosion.

The organic finish applied to the Alodized* aluminum is called "Porcenamel." It is a thermosetting plastic material, quite hard and durable, yet flexible enough to permit the coated metal to be formed without damage to the paint finish.

Arrow uses a secret pressure coating process to apply this finish to the base metal. The baked finish shows excellent bond strength, depth

*Registered trade mark, American Chemical Paint Co.

of color, and durability. A feature of the finishing technique makes possible the production of "Twintone" —a two-color awning metal which is white on one side and another color on the other side.

According to customers' specifications, the coated awning metal can be re-rolled for delivery, or can be roll-formed (Fig. 3) by Arrow so that it is ready for assembly or installation by the awning manufacturer.

Characteristics of "Porcenamel" coated aluminum include the following:

1. It provides a high quality, weather-resistant finish composed of a thermosetting plastic baked on under controlled conditions.
2. The coated metal can be formed without damage to the coating.
3. The continuous surface preparation and coating process makes possible better quality control, greater economy of operation, and a more uniform product.

The excellence of its product, plus its ample production capacity assure Arrow Metal Products of a leading place in the metal "precoating" field.

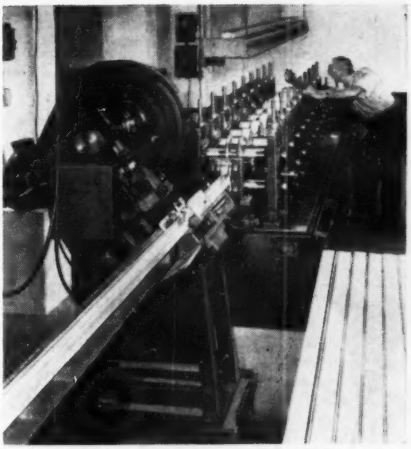

Fig. 3—A large roll forming machine, one of the many at Arrow, where the precoated "Porcenamel" material starting in flat coil sheets is converted into a finished product, one that already has a perfect finish on it.

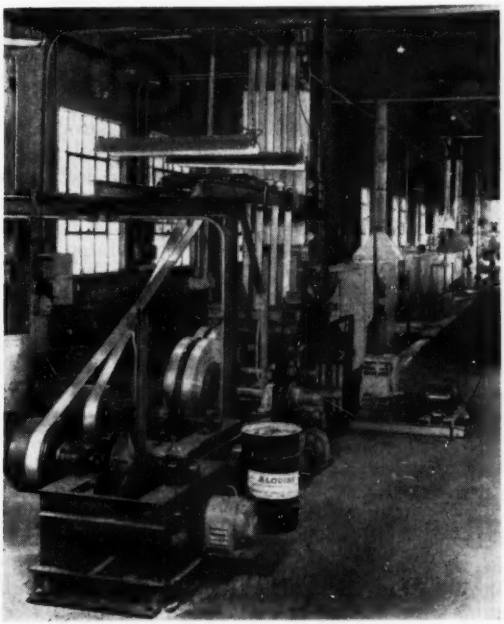

Fig. 2—The Alodizing line where in five different tanks the raw aluminum is degreased and rinsed, then coated with American Chemical Paint Company's Alodine 1200 and re-rolled prior to receiving its pressure coating of "Porcenamel." The Alodine process provides a corrosion resisting base on aluminum for enamel coating.

Finishnig Clinic

(For Finishing Problems)

Question. *As a production executive I am concerned with finding a suitable and economical method of applying a satin finish to an aluminum chair frame. The fact that these frames are welded precludes the use of an abrasive belt because of limited access. The finish we desire is a brush-satin with little or no luster. We clear varnish over the satin.*

Do you have any recommendations?

F. G.

Answer. Before recommending three specific processes for applying a satin finish to aluminum chair frames, we should like to point out that it may be possible to use abrasive belt polishing equipment for this work, employing special adapters developed by abrasive belt manufacturers. If this possibility appeals to you, we suggest that you contact the following companies: (names listed).

One of the three general methods of producing a satin finish involves the use of a wheel made up of stiff bristle brushes and strips of abrasive cloth or paper to form a single polishing wheel. Information concerning this product may be secured from: (name given).

The second method involves the use of bristle brushes (either wire brushes or Tampico brushes) together with a suitable polishing or brushing compound.

The third method involves the use of ordinary cloth buffs with the proper buffing compound to produce a satin finish rather than a bright finish (which is normally produced when metal is buffed on a cloth buff).

To employ the processes just described requires that the design of the aluminum chair frames be such that the frames may be rotated completely around the buffing or polishing wheel. If such is not possible, then the use of narrow strips of abrasive belt material together with the special adapters referred to in the first paragraph of this letter may offer some promise.

——— *fc* ———

Question. *In* PRODUCTS FINISHING, *issue of February 1953, page 57, your "Finishing Clinic" refers to the three methods for coloring aluminum. In your answer, you mention a new process of treating the surface of aluminum*

o form oxide coating and coloring the urface in one operation.

I would appreciate your referring ne as promptly as you can to the com- anies marketing such products.

In addition, and at your convenience, would further appreciate your refer- ing me to such companies as do, or ave products and solutions for, color- ng aluminum by electrolytic anodizing n sulfuric acid, followed by dipping in lye and sealing in boiling water. If here are other means or processes, imple in nature, for the coloring of luminum and aluminum alloys, I vould like to hear from you on those is well.

May I say that I would like particularly to know whether any or all of the bove processes or products for color- ng aluminum are effective on sand- blasted aluminum.

A. C. K.

Answer. We are referring you to sources for the information you requested.

Provided the sandblasted aluminum were properly cleaned and prepared, anodizing and coloring processes should be just as effective on that type of surface as any other.

——— *fc* ———

Question. *Our problem is finishing bright basic or hot rolled ¼ inch square rod in bronze finishes. We can spray it but lose about 80 to 90 per cent of paint as article has very little metal surface.*

We have been spraying with a mixture of the bronze powder and clear bronzing lacquer. We would like to know if we can dip these stands for speed and saving of paint. We could dip them in either lacquer or air-dry synthetic, if feasible.

L. S.

Answer. Normally it is difficult to dip finish articles in a mixture of bronze powder and a suitable lacquer. However, your paint supplier might be able to formulate a material which would be most satisfactory. In this connection you might like to contact the following companies: (names listed).

Should your production justify such an installation, you might be interested in equipping your plant with electrostatic spraying equipment. With electrostatic equipment there is practically no paint loss through overspray. Manufacturers of this type of equipment include: (names listed).

——— *fc* ———

Question. *Do you know of any process, or recent development, which will eliminate the hand buffing operation in the preparation of irregular zinc alloy die cast shapes for chrome plating?*

H. N. C.

Answer. We should like to refer you to the following manufacturers of barrel tumbling equipment who can offer detailed suggestions concerning processing of die castings: (names listed).

Usually, at least one operation on a polishing wheel or belt must be applied to a die casting to remove the "parting line." Surface characteristics of the castings, porosity, and other characteristics also determine the suitability of the products for finishing by barrel methods. Both barrel tumbling in an abrasive media and in a soap solution with steel balls are employed.

DO YOU HAVE A FINISHING PROBLEM?

The editorial staff of PRODUCTS FINISHING is prepared to aid you in the solution of your problem.

There is no charge for this service.

Electroless Plating In Production

By THOMAS A. DICKINSON

CHEMPLATE COMPANY of Los Angeles has established what is believed to be the first plant for the electroless plating of ferrous and cuprous materials on a large-scale production basis.

This is an interesting and important development because it permits an accurate evaluation of the industrial potentialities of the electroless technique.

Development of the Process

Electroless plating involves the reduction of a nickel salt in a heated solution by means of hypophosphites. Its theoretical possibilities have been known to researchers since about 1845, but there was no good reason to believe it would find practical applications until 1946—when Abner Brenner[1] and Grace Riddell of the National Bureau of Standards learned how to inhibit the spontaneous reduction of nickel salt in solution so that nothing more than a desirable catalytic action would occur.

Brenner and Riddell first discovered that they could plate out nickel on any metal which acted as a catalyst (without filling up the bath with "black" nickel) simply by controlling the composition and temperature of the plating solution. Then they found they could nickel plate some metals which did not act catalytically by bringing the materials in contact with metals that were electro-negative, or by immersing the materials to be plated in a solu-

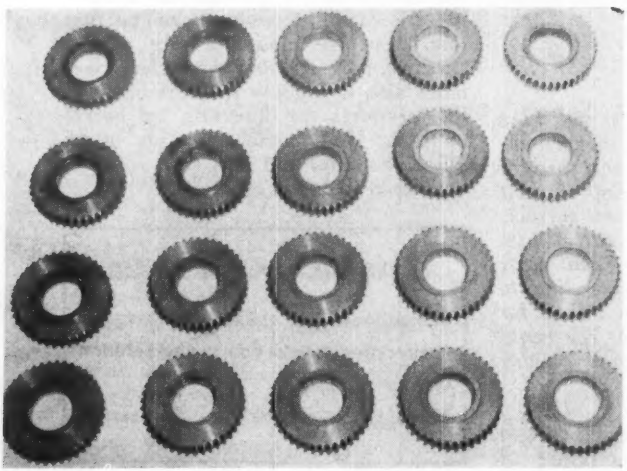

Fig. 1—The teeth of the brass gears shown here were masked with heat-resistant strip coatings so that the center sections alone could be nickel plated with electroless facilities at Chemplate Co., Los Angeles.

tion containing a catalytic metal such as palladium.

Since then, many large and small companies have experimented along lines suggested by the NBS discoveries. Some have evolved laboratory methods of depositing materials other than nickel on metals and nonmetals. Others — notably General American Transportation Corporation of Chicago and Metal Processing Company of Cedar Grove, N. J. —have announced the development of electroless plating procedures. However, Chemplate has given the electroless concept an all-out industrial test.

Virtually all of Chemplate's electroless production work at present involves the deposition of nickel on steel and brass alloys (Fig. 1), but the company maintains a sizeable research laboratory and is said to be prepared to do other types of electroless work—when and if there is a demand for it. The scope of the company's present production program is indicated by the fact that it necessitates the constant use of 20 tanks (Fig. 2) with capacities ranging from 200 to 500 gallons.

Chemplate officials have learned that the primary success secret in electroless work consists of knowing how to clean deposition surfaces properly. However, in work with ferrous and cuprous alloys, they say this is no more difficult than the task of preparing materials which must be electroplated. It normally involves:

1. Immersion of the materials in an emulsion cleaner.
2. Rinsing with cold water.
3. Removal of rust with a suitable acid solution.
4. Removal of greases with an alkali cleaner.
5. Removal of oxides with a final acid dip.

Cleaned materials are immediately immersed in a plating solution which is heated to a temperature of 210 deg. F. to speed the chemical reaction and maintain a high rate of metal deposition.

Chemplate officials are naturally reluctant to disclose the precise composition of their production plating solution, but they say it is functionally similar to the following acid bath developed by Brenner and Riddell:

Fig. 2 — General view of electroless plating facilities at Chemplate Company.

Fig. 3—A Chemplate worker removes nickel plated articles from a heated electroless plating bath.

Nickel Chloride ....4 oz./gal.
Sodium
Hypophosphite ...1.3 oz./gal.
Sodium
Hydroxyacetate ..6.7 oz./gal.
Brighteners ..... Optional

With a solution of this type, a pH in the range of 4.5 to 6 is usually considered best for a maximum plating rate (that is, up to about 0.0005 inch per hour).

The best yield obtained by Brenner and Riddell, based on the conversion of hypophosphite to phosphite, was 37 per cent. In other words, about 5.5 pounds of sodium hypophosphite were required to deposit each pound of plating. As a rule, the capacity of the bath was such that no more than 0.5 sq. ft. of material could be satisfactorily plated by a gallon of solution (Fig. 3).

It is interesting to note that the electroless process makes it possible to finish many product surfaces that could not otherwise be coated due to inadequate throwing power of electroplating solutions. Both the inner and outer surfaces of a tube can be simultaneously nickel-plated with electroless facilities.

As a matter of fact, in some of the aircraft components that have been finished by Chemplate, the surfaces of holes with diameters of less than $\frac{1}{8}$ inch have been uniformly nickel plated from one end to the other — despite lengths of several inches. The uniform thicknesses of electroless coatings are especially advantageous where extreme dimensional accuracy is an essential feature of plated components.

There are no theoretical limitations on the thinness or thickness of an electroless coating, but there are some practical limitations in view of the fact that the cost of a given coating is proportional to its thick-

Fig. 4—Special purification equipment must be employed to maintain solutions of adequate quality. Such equipment in the Chemplate plant includes a sand filter and a resin-type deionizer.

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ness. Where it has been necessary to reclaim expensive metal parts which were over-machined, Chemplate personnel have applied nickel coatings with thicknesses up to 0.013 inch. However, the best thicknesses for most practical purposes are approximately as follows:

Indoor protection . . . 0.0005 inch
Mild outdoor protection . . . . . 0.001 inch
Severe outdoor protection . . . . . 0.0015-0.002 inch
Abrasion resistance . . . . 0.001-0.003 inch

The accuracy of these dimensions can usually be maintained within plus-minus 0.00005 inch.

Standard qualitative tests have consistently shown that the adhesion of Chemplate's nickel coatings to brass and steel exceeds 50,000 p.s.i.

The throwing power of an electroless plating bath is apparently limited only by the ability of the solution to come in contact with various deposition surfaces.

Chemplate officials claim their coatings have been used with particular success on gears, bearing surfaces, and other components which require extreme wear resistance.

Corrosion resistance tests, made by Chemplate engineers with steel specimens which had electroless nickel coatings of 0.001 inch thickness, yielded the following typical results.

1. Salt spray —200 hours, minimum, without generalized rusting.
2. Outdoor exposure — six months, minimum, without any rusting.
3. Hot water immersion — six weeks in 180 deg. F. air-agi-

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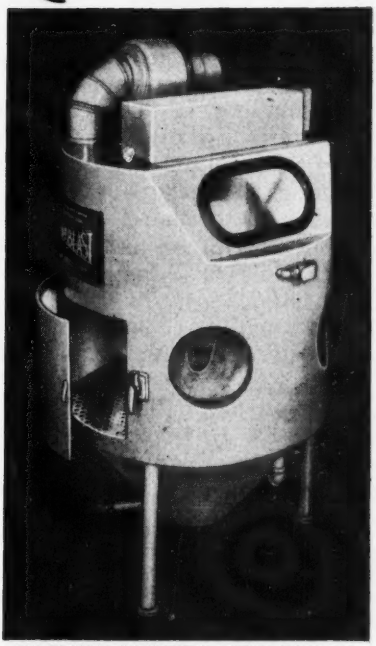

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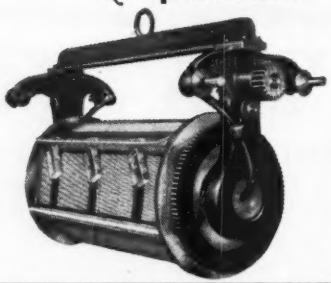

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tated water with no visible rusting.

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Where it is desirable to increase both the ductility and mechanical strength of an electroless nickel coating, plated components are heat treated for short periods of time at temperatures up to 1100 deg. F. Higher temperatures tend to reduce the surface hardness as well as the brittleness of the nickel coatings.

Because brightness has nothing to do with the basic properties of electroless nickel coatings, Chemplate officials usually recommend dull or semi-bright finishes for components that must serve strictly utilitarian purposes in order to minimize finishing costs. However, by adding brighteners to their plating baths, they can produce bright coatings (despite the fact that electroless nickel coatings normally comprise about 93 per cent nickel and 7 per cent phosphides).

Due to the need for relatively hot plating solutions, parts processed with electroless equipment cannot be marked in a conventional manner where certain specified surface areas alone must be finished. However, Chemplate engineers have discovered that parts can be satisfactorily masked for electroless plating operations with heat-resistant plastic strip coatings.

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[1] Brenner and Riddell, J. Res. NBS 37.31 (1946) RP 1725.

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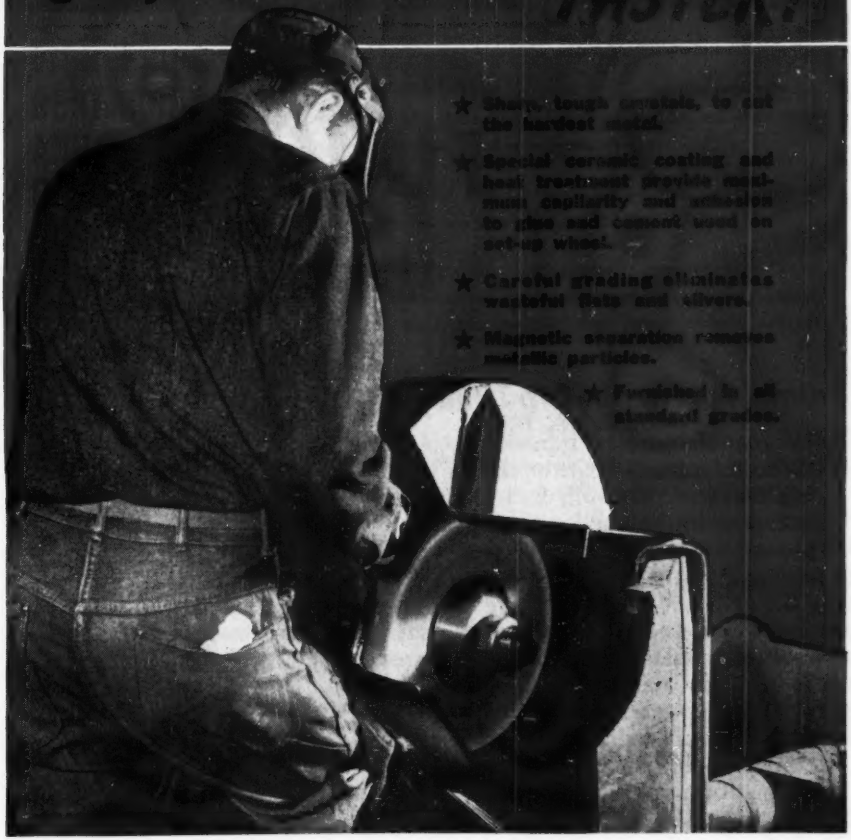

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Animal Fats In Hot-Dip Tinning

THE manufacture of tinned steel sheet has been for many years one of the major consumers of palm oil, both in hot-dip tinning operations and in the cold-reduction process for steel strip. Since palm oil is not produced in the United States but is entirely an article of import, there has long been interest in the development of a satisfactory substitute material. Recent progress in this field has been reported by the Eastern Regional Research Laboratory of the U. S. Department of Agriculture in cooperation with the Armour Research Foundation of Illinois Institute of Technology.

Hot-Tinning

Both the hot-dip process and the electroplating process are commercially important means of tinning steel sheets. This paper is concerned only with the former method, which is the older and still an important process. In this operation, steel base plates which have been rolled to the desired thickness and have been prepared for tinning by pickling, annealing, finish rolling, and final acid dip and underwater storage are passed through the tinning apparatus substantially as shown in Fig. 1. The tin pot is a cast iron container, gas heated with auxiliary gas

By Dr. C. Fred Gurnham,
Head, Dept. of Chemical Engineering,
Michigan State College

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A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

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or electric immersion heaters, which holds from 2 to 5 tons of molten tin. As the steel sheets enter this equipment, they pass first through a floating layer of melted zinc chloride and ammonium chloride flux, and then into the molten tin. Passage of the steel sheets through the bath is controlled by deflectors and rolls as shown in the sketch. As the tinned sheets leave the molten tin, they pass upward through an 18-inch depth of hot palm oil, which floats on the surface of the tin. The oil compartment contains several sets of squeeze rolls, which press off excess tin and thus regulate the coating thickness. The palm oil bath serves to keep the tin coating in a molten condition while passing through the rolls, thus providing a more even distribution of the tin while protecting it from oxidation or discoloration during the cooling and freezing period. After leaving the tinning machine, the tinned sheets are washed and branned to remove excess palm oil, and are then polished, inspected, and packaged.

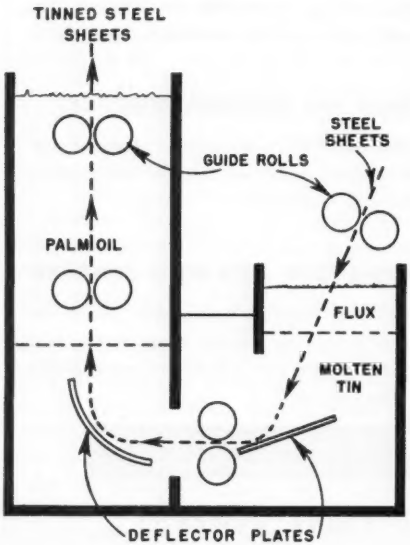


Fig. 1—Sketch of cross-sectional view of hot-dip tinning setup.

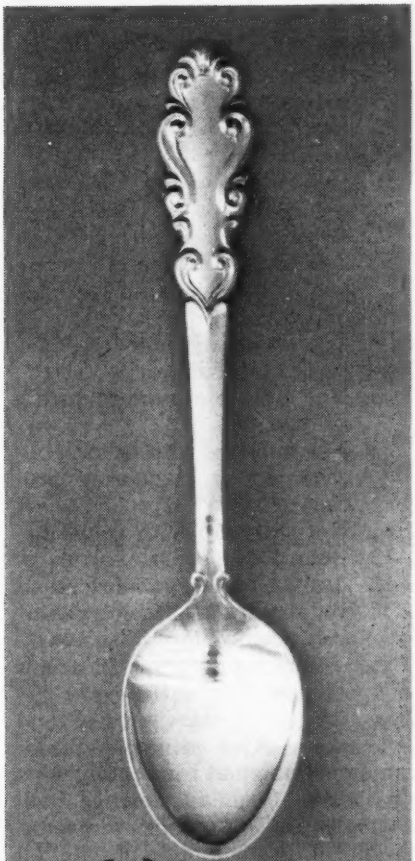
The temperature of the palm oil in the tinning apparatus is maintained at 460 to 465 deg. F., which is 10 or 15 deg. F. above the melting point of tin. At higher temperatures than this, a yellow discoloration of the tin plate is apt to occur, and the palm oil may polymerize or heat-body resulting in poor work and increased oil losses. Some decomposition or degradation of the palm oil is inevitable, but this is kept under control by the natural dragout of oil on the tinned sheet and by replenishment of the bath with fresh oil. Spent palm oil from the tin bath is sometimes used in the cold-reduction process for steel strip.

In the electrolytic tin plating process, molten tin is not used and the palm oil finishing bath is not required. However, even in this process, palm oil is frequently used in the form of a hot bath to flow the tin in order to produce a uniform and smooth coating. Modern high-speed electrotinning units, however, avoid the use of palm oil entirely and obtain the flowing by means of induction heaters.

Requirements for a Tinning Oil

The essential requirements for an oil to be used in the hot-dip tinning process were listed by Ference and co-workers in a paper presented to the American Oil Chemists' Society in 1949 (J. Am. Oil Chem. Soc. 27, 122-7; 1950). These characteristics

How would you SOLVE IT?



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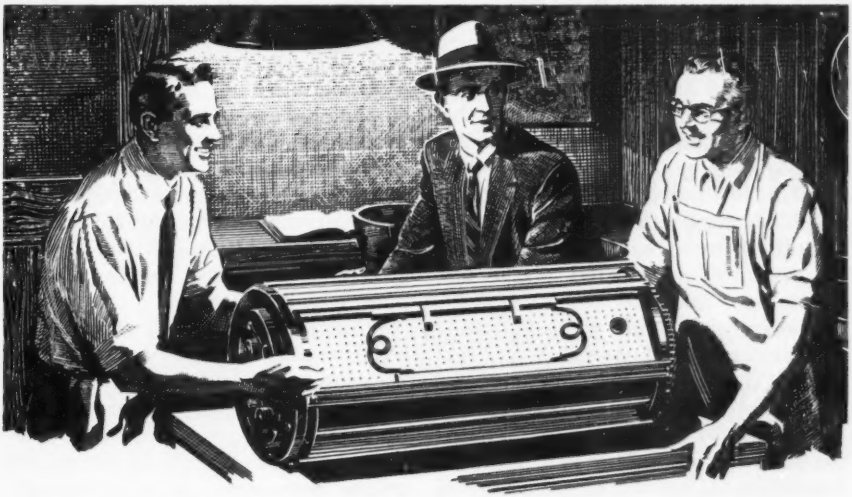
are as follows:

1. Make smooth, bright, good quality tin plate.
2. Drain rapidly and freely from the sheet.
3. Be of low volatility.
4. Have high flash and fire points.
5. Neither oxidize nor polymerize readily.
6. Be cleaned from the sheet readily.
7. Be of low viscosity at 100 to 200 deg. F. so that it may be pumped or poured without difficulty.
8. Be non-toxic, odor-free, and preferably edible.
9. Not become rancid during storage.
10. Not interfere with lithographgraphing or lacquering procedures.
11. Not interfere with soldering.
12. Retard atmospheric corrosion.
13. Assist handling in fabrication.
14. Be readily available, preferably from domestic sources.

Palm oil meets these specifications to a commercially satisfactory degree although it does have several deficiencies. The principal disadvantage of palm oil is its foreign origin, which frequently causes both strategic and economic problems. Technical disadvantages of palm oil include its rather low flash and fire points, the volatility at tin-pot temperatures which causes losses and an increase in viscosity, the need for a preconditioning heat treatment to reduce flammability and to remove moisture, and the variability of the raw material with respect to dirt and moisture content and the degree of rancidity.

ONE OF A SERIES OF ADVERTISEMENTS ON THE HISTORY OF ELECTROPLATING



a midnight sale that opened **the door to new plating profits**

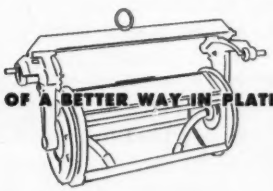
Back in 1934, Udylite's young president, L. K. Lindahl, threw the necessary parts for a complete plating barrel into his car and headed for Kokomo, Indiana. He arrived at midnight. His prospective customers – a plating shop owner and the superintendent–were waiting for him.

On the shop owner's desk, Lindahl assembled, disassembled and reassembled the barrel. It was a perfect machine fit of parts picked at random from stock. It was the first barrel providing perfect assembly of standard parts! Easily removable panels and other superior features of the barrel completely sold both men. Udylite got the order!

The months of research by the Udylite technical team had paid off! The barrel was unique because it was made from a material heretofore untried . . . hard rubber. In addition, electricity was conducted through the ends of the barrel by easily removable contacts. This first Udylite Barrel had again provided *a better way* in plating.

Udylite knew they had the best unit in the industry –one that upped production, cut costs, saved manpower. But the "midnight sale" proved the acceptance and value of this revolutionary product.

In the following years, Udylite Corporation continued to pioneer improvements and innovations in plating barrels. Bakelite, hard rubber and melamine materials were followed by the present super-resistant lucite plating cylinders. But that's not all! Udylite engineering and research teams are constantly at work perfecting still better materials, methods and equipment . . . all designed to give you better plating at lower cost.



PIONEER OF A BETTER WAY IN PLATING...

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

Substitutes for Palm Oil in Hot Tinning

Prior to 1940, a few sporadic attempts were made to provide a domestic substitute for palm oil in the hot-dip tinning process. These attempts were usually not successful because of inadequate knowledge of the basic properties needed in such an oil. A more scientific approach to the problem started about ten years ago, and has led to several promising substitute materials.

Investigators at the Southern Regional Research Laboratory of the U. S. Department of Agriculture reported in 1942 on the use of a hydrogenated cottonseed oil as a palm oil substitute in hot-dip tinning and in the cold-reduction of strip steel. Cottonseed oil hydrogenated to an iodine number of approximately 50 was recommended on the basis of these studies, and specifications were proposed for such a material. The hydrogenated oil, however, is more expensive than palm oil and accordingly it has not been widely accepted by the industry. Perhaps a major factor in the higher price has been the ready market for this oil for edible purposes. Hydrogenated fish oils also have been used, but have never been widely accepted.

Research was started at the Armour Research Foundation of Illinois Institute of Technology under the sponsorship of the American Iron and Steel Institute during 1948, with respect to the use of tallow and tallow derivatives as palm oil substitutes. This research was continued in cooperation with the Eastern Regional Research Laboratory, and results have recently been published by the latter organization in their mimeographed report AIC-354.

Animal Fat Substitutes for Palm Oil

Eight different materials, prepared from animal fats such as lard, grease, and tallow, were evaluated as possible palm oil substitutes in the hot-dip tinning operation. These laboratory tests were made on the basis of the list of desirable characteristics presented above. The eight materials, all of which were adjusted to contain between 7.5 and 8.5 per cent free fatty acids, were described as follows:

A. Prime steam lard, containing 0.1% phenylhydroquinone.
B. Filtrate material (lard oil) from crystallization of prime steam lard from acetone (1 g. to 10 ml.) at 0 deg. C., and containing 0.1% phenylhydroquinone.

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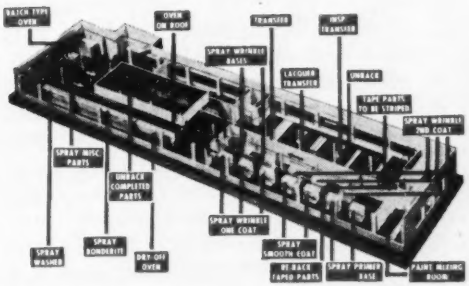

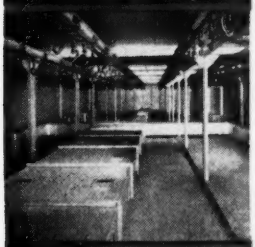

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P-D leadership in the design and manufacture of highly specialized modern paint finishing systems is the result of 25 years experience in a wide range of industries. P-D's recognized facilities and engineering techniques can help solve the problems offered by installations in new or expanding plants. We'll gladly tell you more if you . . . Write, Wire or Phone.

METAL PREPARATION — Operating on a conveyor, metal parts washers are designed by Peters-Dalton to remove all kinds and amounts of dirt sticking to parts. We are a recognized authority on washers that both clean and deposit a bonding or rust-proofing film used before a paint operation.

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BAKING and DRYING — Peters-Dalton designs and manufactures all types and sizes of ovens, including core, dehydration, curing, and special purpose units for direct or indirect gas or oil firing.

Peters-Dalton INC.

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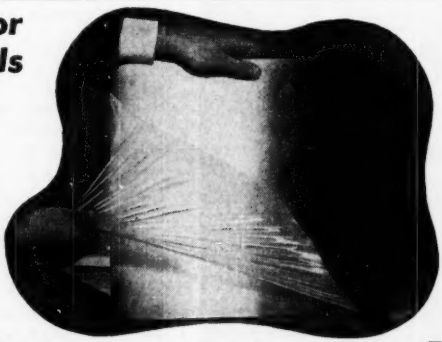
C. Choice tallow, deodorized.
D. Choice tallow, deodorized, and containing 0.1% phenylhydroquinone.
E. Filtrate material from crystallization of choice tallow from acetone (1 g. to 10 ml.) at 23 deg. C., and containing 0.1% phenylhydroquinone.
F. Choice white grease, deodorized.
G. Choice white grease, deodorized and containing 0.1% phenylhydroquinone.
H. Choice white grease, refined, partially hydrogenated, deodorized, and containing 0.1% phenylhydroquinone.

All of these samples were judged as satisfactory on the basis of these tests, which included such determinations as iodine value, titer, flash and fire points, odor, heat bodying characteristics, polyunsaturated acid content, and activity. The last of these, activity, is a measure of the dissolving action of the oil on tin oxide. The increase in viscosity during use is an important test in the selection of tinning oils, and can be evaluated in the laboratory by prolonged heating at hot-dip temperatures. If the viscosity increases too rapidly, it results in excessive drag-out of oil and hence poor oil economy, as well as increased difficulty in the washing or branning step. The presence of a small quantity of an antioxidant such as phenylhydroquinone decreases the polymerizing and oxidizing tendency of the oil, and hence retards the rise in viscosity. On the basis of these tests, Samples D, G, and H were selected

A Strippable Plastic for the Protection of Metals



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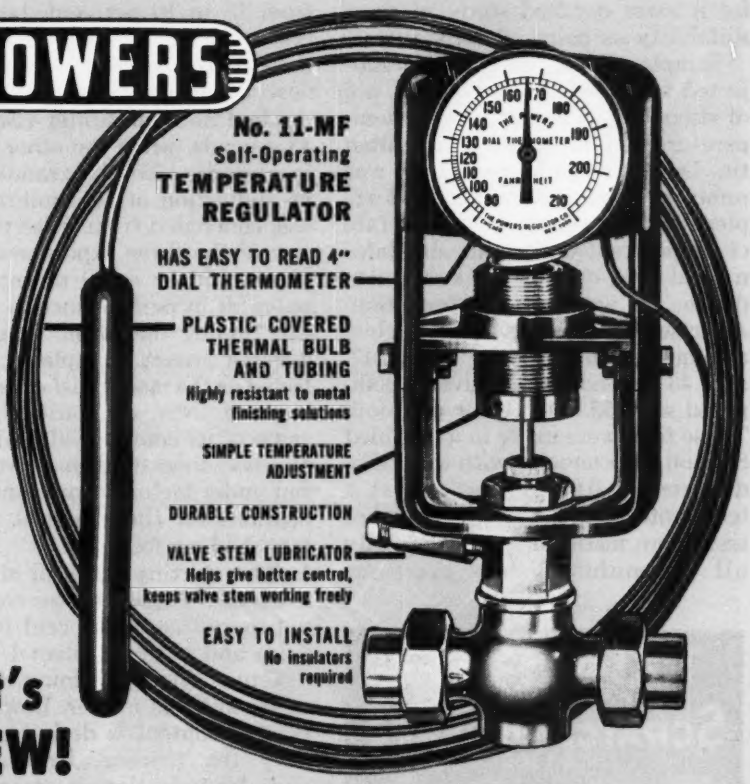

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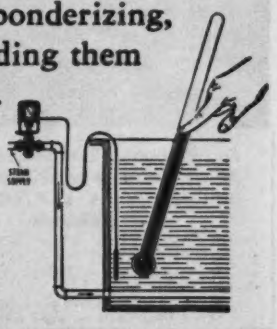

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for a more detailed study of their suitability as palm oil substitutes.

Samples D, G, and H were subjected to extended tests on the rate of viscosity increase at tin-bath temperature and in contact with molten tin. During a 30-day period, oil was removed from the sample and replenished with fresh oil at the rate of 18 per cent daily; this simulates normal drag-out and make-up conditions in actual plant operation. After several days, each oil reached an equilibrium viscosity of 45, 47, and 43 seconds, respectively, compared with 52 seconds for palm oil. These tests were made in a modified Saybolt viscosimeter with an orifice diameter of 0.069 inches and at a temperature of 465 deg. F. Further tests were made in which the daily oil replenishment was decreased from 18 to 10 per cent, because of the reduced dragout expected at these lower viscosities. Under the new conditions, Sample H again reached an equilibrium viscosity of 43 seconds, while the other two oils increased in viscosity gradually with no indication of an equilibrium. It was concluded from these tests that any of the three experimental samples would be equal or superior to palm oil in performance in the hot-dip tinning operation. The hydrogenated grease, Sample H, was selected as the most satisfactory on the basis of these evaluations and because of its commercial availability, and was then used in a production run under factory conditions. Specifications for this material were established as follows:

1. The starting material should be a Choice White Grease containing not more than 4 per cent free fatty acids and not more than 1 per cent moisture, insoluble impurities, and unsaponifiable matter. Low free fatty acid content is desirable to simplify the refining, hydrogenation, and deodorization treatments.
2. Alkali refining of the grease is usually desirable to facilitate the hydrogenation. Extra high quality grease may not require this step or may require only a treatment with activated carbon and filtering.
3. The grease should be hydrogenated under selective conditions, such as 15 to 50 pounds hydrogen (gage) pressures, temperatures of 140-160 deg. C., agitator speeds of 400-500 r.p.m., and nickel catalyst concentrations of 0.1 per cent. The hydrogenation should be controlled in such a manner that substantially only the polyunsaturated fatty acids

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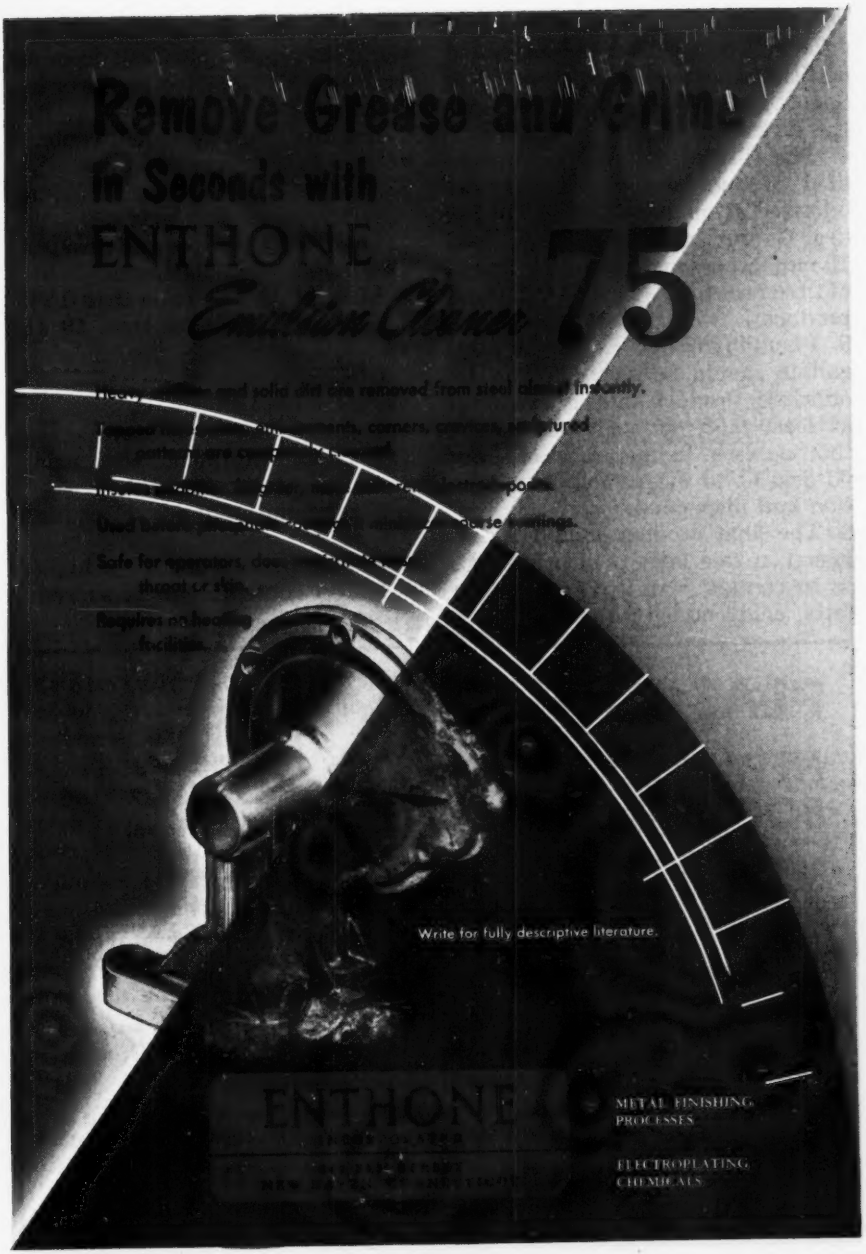
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will be reduced to monounsaturated ("oleic") acids. The product should be filtered at temperatures of 60-70 deg. C. under conditions that remove the nickel effectively.

4. The filtered, partially-hydrogenated product should be steam-deodorized at temperatures of 170-190 deg. C. and pressures not to exceed 15 mm. of mercury, and for a length of time necessary to produce a bland product.

5. Phenylhydroquinone or propyl gallate should be added to the deodorized product to the extent of at least 0.05 per cent and mixed thoroughly at temperatures of about 60 deg. C. to insure complete solution and dispersion.

6. The final product should be adjusted in free fatty acid content so as to contain 8 to 9 per cent. The fatty acids added should be very low in polyunsaturated acid content. Fatty acids obtained from selectively hydrogenated grease or tallow are satisfactory.

The final product should conform to the following specifications:

Free fatty acids: 8 to 10% (calculated as oleic acid).
Moisture, insoluble and unsaponifiable: 1% maximum.
Moisture: Not greater than 0.3%.
Color: Not greater than 13 (F. A. C.).
Odor: Bland.
Titer: 40 to 43 deg. C.
Iodine value: 48 to 54.
Total unsaturated fatty acids: Not greater than 1%.
Flash point: 470 deg. F. or higher.
Fire point: 570 deg. F. or higher.
Nickel content: Not to exceed 5 p.p.m.

PLASCOTE—169

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Applied quickly and easily with paint spray equipment or by brush.
Cuts booth cleaning time in half, by actual test reports.
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Front view of Buffer with open-type spindle mounted on two ball bearings. Recommended for higher speeds and where utmost freedom of operation around wheels is required.

Rear view of Buffer with encased-type spindles mounted on four ball bearings. Recommended for heavy duty service. Note simplicity and rigidity of motor mounting.

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There isn't much to a buffer—a spindle and a pedestal, with a Motor to drive it. For long, trouble-free production, however, these units, especially the spindle, must be right.

The HISEY spindle has a large, one-piece alloy steel shaft mounted on ball bearings. The ball bearings are all locked individually on the shaft and lubricated by oil controlled by sight level gages. Bearing housings are sealed—dust and dirt cannot get in and oil cannot get out.

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V Belts transmit power from motor to shaft. Spindle speed can be changed by merely substituting smaller or larger motor pulley. Any standard power motor can be used.

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The mill test was run at the Inland Steel Company, with steel company operators and technical personnel. The oil viscosity at 210 deg. F. was considerably higher than that of palm oil, but was comparable at 465 deg. F. and was satisfactory in all respects. An equilibrium value was approached after oil replenishment started. The oil consumption was low, amounting to about one-third that of palm oil; during the entire test the consumption was 0.10 pounds per base box compared to an average value of 0.32 for palm oil. (A base box is equivalent to 62,720 square inches of surface tinned, including both sides of the sheet.) The free fatty acid content of the tinning oil as charged was about 8.5 per cent; this decreased during operation and then rose again, but it is believed that an equilibrium acid content of 4 to 8 per cent would eventually be established. The quantity of oil lost by volatility was not measured but was believed to be considerably less than that of palm oil because of the higher flash point and the observably less dense smoke from the pot.

The properties of the tin plate produced during this mill test were comparable in all respects with tin plate produced by the use of palm oil. Among the properties evaluated in this test were lacquer adherence, staining on heating, porosity as measured by the ferrocyanide test, and weight of oil retained. Evaluation of the tin plate by four can companies was also fully satisfactory.

The cost of the recommended hy-

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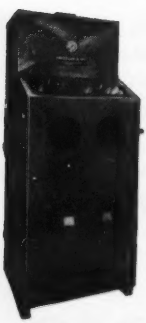

While this casting could be cleaned rapidly enough by conventional dry sand blasting, distortion and etching took place which interfered with subsequent machining operations. Pressure Blasting did this job in 1 minute and 10 seconds with no evidence of clod-working, metal-removal or etching reported.

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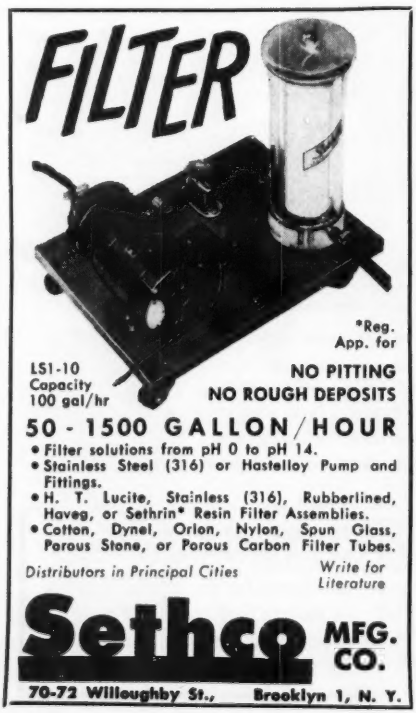
drogenated grease compares favorably with that of palm oil, especially when the decreased consumption is taken into account. The manufacture of this experimental oil included refining, hydrogenation, deodorization, blending with fatty acids, and addition of antioxidant. This complete treatment would add from 2 to 3 cents per pound to the initial cost of the grease. It was concluded that the better grades of greases and tallows, after appropriate processing, would perform as well as or better than palm oil in hot-dip tinning, and that the price of the finished oil would be favorable compared to average prices for palm oil.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Birds and Color

ACCORDING to the Color Research Laboratory of the Sun Chemical Corporation, New York, birds offer the amateur colorist an interesting opportunity to observe protective coloration in action. As a general rule, water birds are soft toned in hue; while jungle birds are gaudy. The mallard duck with its patches of green, blue, purple, white, black, is effectively lost amid rocks, weeds, marine flowers. The peacock, macaw, scarlet tanager, jay kingfisher all have bold coloration. This beautiful plumage is primarily for self-protection.

In birds, response to color reaches a very high development. Birds have color preferences which are probably associated with feeding habits. Since birds do not like green, poisoned foods intended for insects or field mice will not attract birds if colored green.

Birds' eyes contain tiny colored droplets of red, orange, and yellow. The predominating yellow droplets in the eyes of most day birds cut out the blue light, minimizing glare and are a definite aid to vision. The red droplets aid the bird during early morning feeding when the sun's rays are reddish in tint. Many birds are able to see as sharply while feeding as when in flight.

The kingfisher has a predominance of red droplets which aids vision through glaring water. Some birds are partially blind to blue but see red with remarkable clarity.

Night birds have few if any colored droplets in their eyes. The tawny owl is sensitive to infrared and is apparently able to see its prey in darkness by distinguishing the radiation of body heat.

Many jet engine components which now require stainless steel or high alloys may soon be made of much less critical grades of steel protected with a special type of high-temperature porcelain enamel, according to the Porcelain Enamel Institute.

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With the proper treatment equipment, toxic hexavalent chromium can be reduced by sulphur dioxide to the trivalent form and then completely precipitated by alkali for standard removal to a disposal area — such as a lagoon. After this treatment the waste water can be drawn off and safely disposed of in the usual manner. This treatment is in full compliance with most local and state pollution abatement laws.

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Similar equipment is also available for the destruction of cyanide waste by alkaline chlorination.

W&T offers PROVEN EQUIPMENT — hundreds of similar units are serving industry today, EXPERIENCE — over forty years of building chemical feeding equipment, and SERVICE — field representatives are located in principal cities throughout the country.

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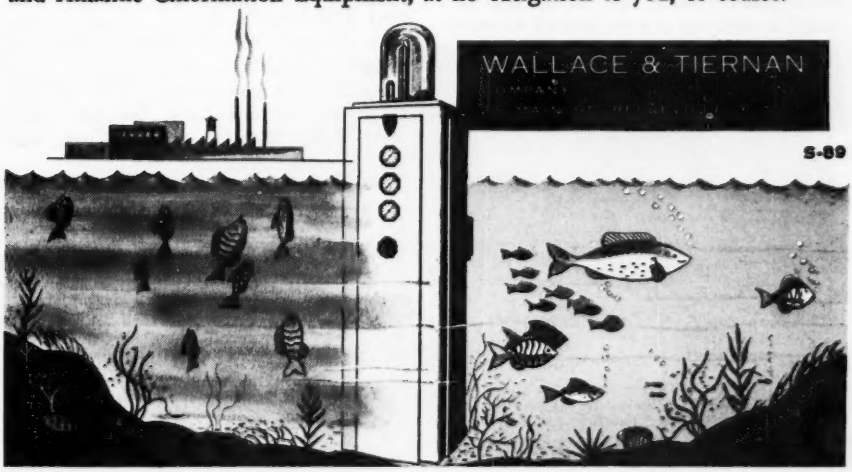


Practical Applications of modern products

Tips on Buffing Aluminum Castings

A large, complicated aluminum casting is now being automatically buffed by The Black & Decker Manufacturing Company, Towson, Maryland, manufacturer of portable electric tools.

B&D makes nearly 150 different models of tools plus several thousand accessories, including bench drill stands, hole saws, wire wheel brushes, and such. Tools going to industry are not highly polished, but units sold in its Utility line end up on the counters of hardware, department and specialty stores. To give them eye-appeal, they need to be both buffed and colored.

The problem of buffing this particular casting, a housing for a portable electric saw, came up when B&D decided to put out a new line of consumer tools called "Black & Decker Utility Tools." The problem facing the supervisor of metal finishing at B&D was that of buffing and coloring a majority of the Utility line parts automatically.

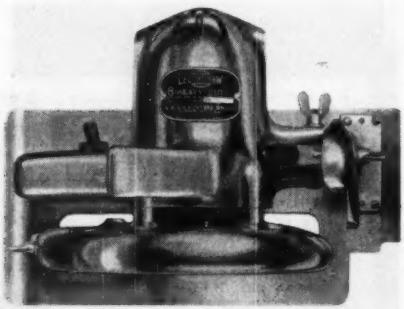


Fig. 1—The Black & Decker 8-inch Heavy Duty Utility Lectro-Saw. As can be noted, the principal casting comprising the saw housing has a variety of curved and angled surfaces which would tend to make automatic buffing difficult.

A piece that seriously defied automatic buffing was the housing for the 8 inch Heavy-Duty Utility Saw. The casting for this part is about 5 inches in diameter and 6½ inches long (Fig. 1).

Since the casting includes most of the handle, its projections presented problems which seemed to defy an automatic buffing operation.

To find an automatic buffing machine big enough and rugged enough to buff the saw case, company men made a tour of several buffing installations in the immediate area, including plants in Philadelphia, Allentown, Pa., and Trenton, N. J.

A Detroit manufacturer, upon request from B&D, re-designed one of his standard machines to B&D specifications. The machine, besides doing continuous straight line buffing, also rotates intermittently.

The next step was determining the proper buffing speed — the speed at which the buffs would not mush, at which there would be the least wiping off of buffing compound, and at which the buffs would cover the most surface without pulling or distorting holes on the casting. After testing speeds from 400 to 2,400 rpm with a number of different size buffs, the best combination of rpm and buff size was determined.

In setting up the machine, it was found that the saw case had to be turned many ways to be completely buffed. Also it was found that several buffing heads were needed to do the job.

Buffing is accomplished in several steps. An operator working at the machine's mouth advances castings from one jig to the next until a casting is re-positioned the required number of times to complete the buffing. At that time, he removes the finished casting and starts a new one.

As a casting passes around a rotary table it comes in contact with a buff that is held by a spindle. For this operation, the Hanson-Van Winkle-Munning Ruff-L-Buff, a specially constructed ventilated buff is used. The spindle is set under a spring and permits the buff to ride the casting passing beneath it. A motor drives each spindle, and a ratchet mechanism automatically feeds buffing composition to the spinning buffs (Fig. 2).

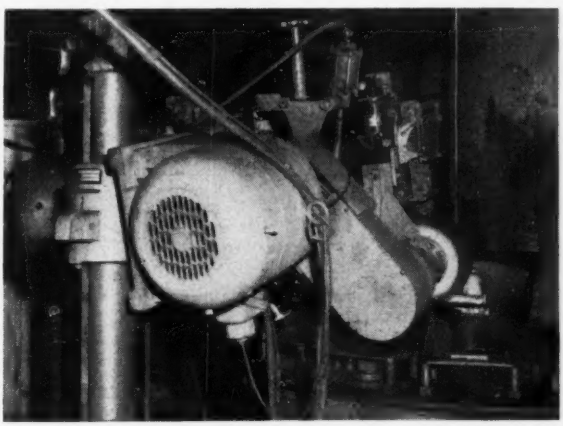


Fig. 2—A view of a saw housing mounted on a rotary table passing below one of the buffing machines used in this multi-step finishing operation. The adjustable buffing machine is a product of Acme Manufacturing Company, Detroit, Michigan. Above the rotating buff is mounted a Nankervis automatic buffing compound applicator.

The operator of the machine works beside a panel board. He may start and stop each head, the table, or the spindles. He may raise or lower the heads, or stop the complete operation (Fig. 3).

After the machine was finally set up to do the job the way B&D wanted it, the vital statistics for the operations were recorded. With the set-up data recorded, the B&D shop foreman can shut down the machine, have it re-set to do other buffing assignments, and then come back at any time and buff the saw case precisely the same way as before.

In selecting buffs and compositions for the job, B&D followed the same procedure used in selecting the buffing machine. A number of makes and varieties of compositions and buffs were investigated.

"Using a cost per piece method and

maintaining our standard quality, we determined the type of compound and buffing that would give us the most economical job. We also found this did not mean the cheapest compounds or buffs," says B&D's Jim Taylor, supervisor of finishing operations at the time.

B&D's experience in buffing aluminum units was limited to small parts, such as knobs, cover plates and the like. On their tours, company men began to realize the importance of belt polishing prior to buffing. Subsequently, they contacted belt suppliers and collected information on rates, break-even point on the length of the belt, types of belts, and flexibility. A satisfactory belt polishing machine was then designed (Fig. 4).

After the pains of study and experimenting, Black & Decker has set up a smooth working operation. Besides the saw case, it now cuts and polishes over 22 different aluminum castings.

After a large part of the saw case is buffed on the automatic machine, it is finished off completely by hand buffing. Spots in and around the handle, which could not be reached by the automatic machine, are taken care of by the hand buffing operation. When working on the saw case, B&D usually has two hand buffing machines going. Buffs used here are also Hanson-Van Winkle-Munning Ruff-L-Buffs.

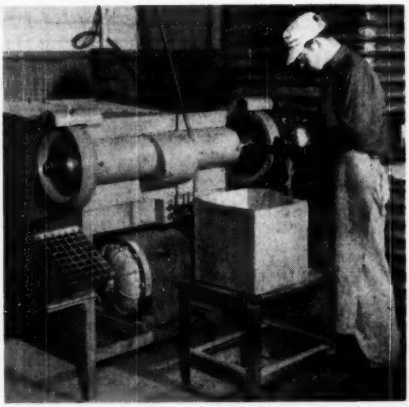


Fig. 4—A preliminary polishing operation is performed on aluminum castings using abrasive belts and a backstand polishing lathe.

Cleaning After Buffing

After hand buffing, the castings are given a thorough cleaning. Parts to be cleaned are placed in a basket and carried from the hand buffing machines to the washer.

The washer is run by two operators.

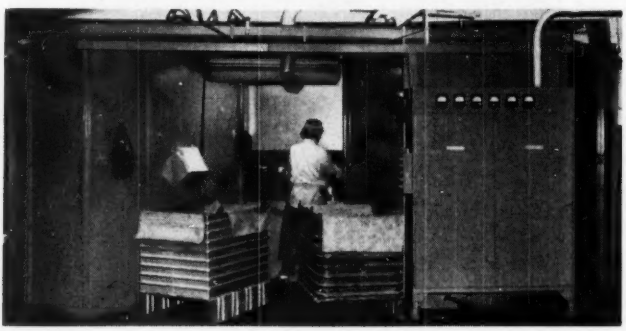


Fig. 3—A view of the totally enclosed automatic buffing machine. The operator stands at the loading and unloading station and can control the entire machine from this point. A dust collector removes buffing dust from the machine.

One operator is stationed at the front end, loosening bolts on the saw handle, and placing the castings on the belt conveyor feeding into the washer. The other operator, stationed at the far end of the washer, receives the washed castings, tightens the bolts, and places the castings in the mobile basket.

Purpose of loosening the bolts is to permit the alkali bath to get at any grime caught in the handle. After washing, castings are dried and carried to the coloring buffs (Fig. 5).

Comments on Buffing and Buffiing Equipment

Buffing specifications must be rigidly adhered to. When there are several pieces making up the finished tool, each piece must be polished to the same degree of brightness, or the assembled tool will look like a patch work quilt. Probably the most important step in the finishing operation, according to the company's supervisor, is the "step before."

The foreman in charge of the finishing process is always concerned about the pressures of the buffs on the automatic machines. He claims it doesn't take much force to knock the ear off the ordinary aluminum casting.

Besides damaging the casting, high pressures may cause excessive heat. Too little composition applied to the buff may also cause heat. One big help, of course, has been the new ventilated buff. This buff can stand higher temperatures and pressures than the non-ventilated buff.

How is this buff cooled? When two or more are combined to make up a buffing wheel, ventilating air enters the wheel through holes in the fibreboard centers of the buffs. As the wheel rotates, centrifugal forces drive the air through 12 channels between each buff to the cloth portions of the buff where numerous ruffles distribute the air over the buff side and channel it on through the wheel, cooling as it goes.

This makes it possible to operate wheels at higher speeds and to apply greater pressure between the work and the wheel. The net result is faster buffing with less buff wear. The ventilat-

Fig. 5 — Final coloring operations are performed on B & D aluminum saw housings in the conventional manner. To insure a high polish on the completed product, castings are thoroughly cleaned after the buffing operation and prior to the final coloring operation.
(Photos courtesy Hanson-Van Winkle - Munning Co., Matawan, N. J.)

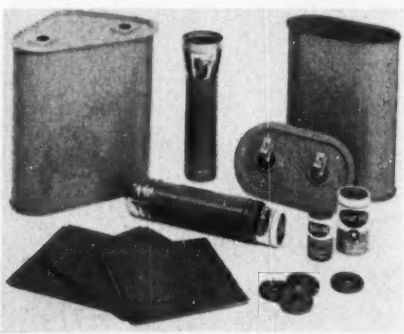
ing feature also results in the use of less buffing composition as the composition binder is not volatilized by excessive heat.

Cloth used in making the buffs is cut diagonally to the threads. This "bias construction" exposes to the work the maximum number of thread ends, thus getting more cutting action per revolution. Since cloth cut on the bias does not ravel, buffs wear longer, and also, there is less lint, which means that less buffing composition is wasted since less of it is discarded with lint.

The company has installed several automatic machines with multiple buffing heads. To control buffing composition dust, turntable and heads are enclosed completely except for the opening through which the operator works. Each buffing machine has a dust collector attached to it.

Flashlight Cases Fabricated from Pre-Coated Metal Coil

BRIGHT Star Industries of Clifton, N. J., formerly known as Bright Star Battery Company, now uses pre-coated metal coil in several of its important production operations.



First adopted for battery tops on flashlight, photoflash, and industrial batteries, pre-coated metal stock is now used for flashlight cases and for metal containers for telephone batteries (Fig. 1).

Bright Star has discovered that pre-coated metal coil offers these advantages:

1. Faster production time—through the use of automatic coil feed.
2. Lower inventory of metal stock. Pre-coated coil for battery tops is supplied with different colors on either side, allowing the same coil to be used for two different colored battery tops.
3. Eye-catching sales appeal. Uniformity of the attractive finish reflects uniformity of product.
4. Lower scrap loss because coils can be supplied to exact width required, and because scrap loss on ends is negligible when long coils are used.

The pre-coated coil used in manufacturing flashlight cases and other products is manufactured by Enamelstrip Corporation of Allentown, Pa., supplier of pre-coated metal coil.

By using pre-coated coil for blanking and drawing battery tops, Bright Star was able to up production more than 100 per cent. The finish holds up under a draw that produces a deep,

Fig. 1—Battery tops, containers for telephone batteries, and flashlight tubes fabricated from pre-coated metal coil. The pre-coated metal coil can be subjected to severe forming operations with no separation of enamel from the metal base.

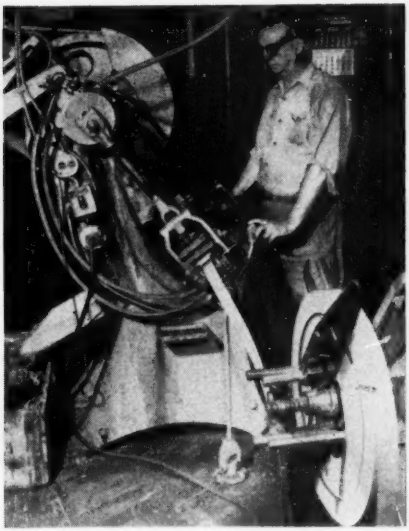


Fig. 2—Battery tops are blanked and formed from pre-coated metal coil stock in an inclined press.

narrow rim around the edge of the cap (Fig. 2). It also stands the abuse of tumble feed hoppers and automatic assembly operations without marring.

Pre-coating the coil assures a high degree of uniformity of color throughout the coil—Bright Star can be sure that all the batteries in a sales display are the same shade and reflect the uniformity of the product.

Encouraged by the success of coated coil in fabricating battery tops, Bright Star next experimented with the material in making tubes for its popular line of flashlights and in metal containers for telephone batteries. Pre-coated metal coil proved entirely successful in both applications and is now used on a production basis (Fig. 3).

The flashlight tubes are fabricated from red, green, blue or black steel coil —5 1/32-inch wide, 0.010 gauge and coated on both sides. The coated metal is first blanked, then embossed to form the deep corrugation (for a firm hand grip on the flashlight).

Finally the blank is rolled and two edges joined with a lock seam to form the tube. Despite the severe embossing operation, the paint adheres firmly to the metal base.

The metal containers for telephone batteries are made from metal coil pre-coated on both sides with grey enamel. Although the material is bent, crimped, formed and spun, the coating on the finished containers remains intact.

The pre-coated coil produced by Enamelstrip Corporation comes in a wide range of colors from one end of the spectrum to the other, permitting fabricators to select those best suited to their products. Unformity of finish

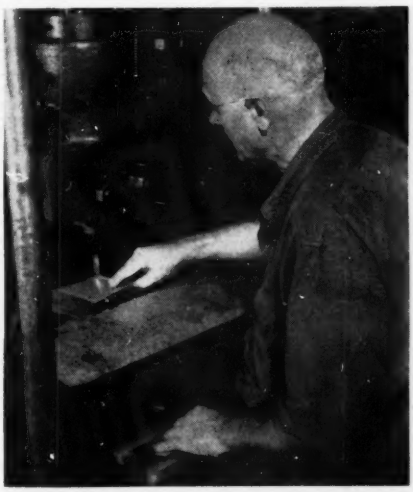


Fig. 3—Flashlight tube blanks are embossed to provide a firm grip on flashlight case. Despite the deep corrugations, the finish adheres firmly to the metal base.

to page 74→

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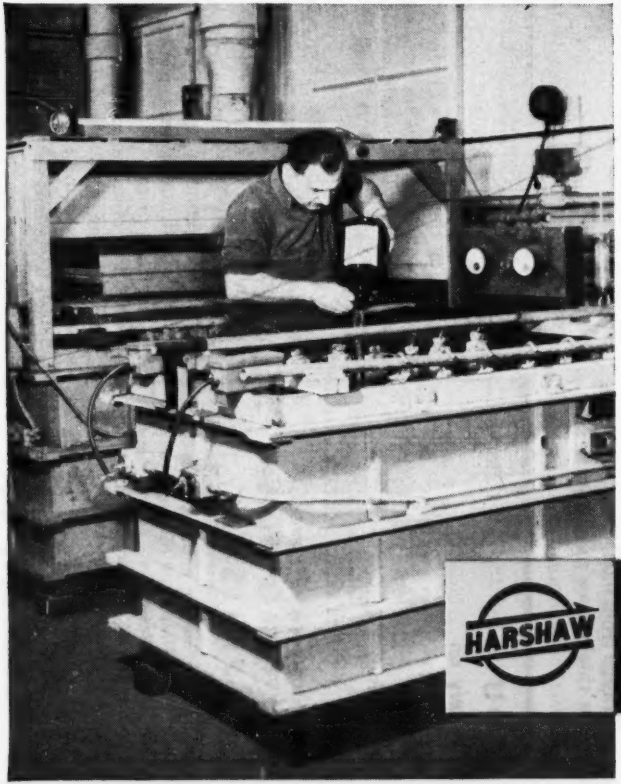

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on the pre-coated coil further enhances the appearance of the finished product.

The finish is bonded to the metal by a phosphatizing process to permit stamping, piercing, intricate embossing, and drawing without damage to the finish.

Enamelstrip comes in cold-rolled steel, electro-galvanized steel, electrolytic tin plate, brass, zinc, and aluminum—in widths from 7/32 inch up to 30 inches, and in thicknesses ranging from 0.006 to 0.040 inch. Fabricators have a choice of a wide variety of finishes—alkyds, ureas, alkydureas, vinyls, oleo-resinous, formaldehydes, sanitary lacquers, epons, plastics and semi-plastics, and adhesives. Film thicknesses range from 0.00005 to 0.002 inch. Heavier thicknesses may be specified.

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Geon Vinyl Plastic Protects Jet Engine Blade Tote Baskets

TOTE baskets to carry jet engine compressor blades, used at Utica Drop Forge & Tool Company, Clayville, N. Y., are being plastic-coated with a newly formulated vinyl plastisol made from B. F. Goodrich Company's Geon paste resin.

In order to withstand the effects of trichlorethylene degreasing baths used in the blade manufacturing operation, it was found that a new vinyl plastisol formulated by The Stanley Chemical Company, East Berlin, Conn., would provide the proper protection. The plastisol also provides tough, durable coating for the tote baskets which are used as protective racks and carriers throughout each stage of jet blade manufacture.

A difficult problem was encountered in coating the baskets with an ordinary plastisol coating because in test runs the trichlorethylene would seep underneath the covering and break through the plastic.

After considerable experimenting, Stanley Chemical came up with a special plastisol, 77X-1078, which resists not only trichlorethylene but also perchlorethylene. The surface of the plastic is hard enough and slick to facilitate rapid draining and minimize carry-over. A primer is used under this plastisol to obtain maximum adhesion.

The following method is suggested for coating an object that will be resistant to trichlorethylene and perchlorethylene:

1. Apply Stanley primer, reduced three to two with special thinner, by dipping. For maximum adhe-

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Vinyl plastisol made from B. F. Goodrich Chemical Company's Geon paste resin provides protection for these tote baskets used to carry jet engine compressor blades through trichlorethylene degreasing bath.
(Photo courtesy B. F. Goodrich Chemical Co., Cleveland, Ohio)

sion, apply two coats, allowing 10 minutes for air drying between coats. Air dry the two coats for 30 minutes. The minimum thickness of the primer coating should be 1.5 mils.

2. Bake the primer for 10 minutes at 400 deg. F.
3. While the object is still hot, dip it into the plastisol and keep immersed for 20 to 30 seconds.
4. Withdraw very slowly.
5. Bake the coated item for 30 minutes at 385-400 deg. F., making sure that the temperature control is accurate.

The length of baking depends on the mass of metal being coated. Thirty minutes is minimum time.

TUMBLING BARREL CATALOG. A 12-page illustrated **CATALOG B-9** showing the complete line of horizontal and tilting-type Globe Tumbling barrels has been released by **Globe Stamping Division, Hupp Corporation,** 1250 West 76th St., Cleveland 2, Ohio.

Special features, such as the use of agitator strips and "work shifting" bottoms on the tilting barrels are illustrated with drawings and photos. Also covered is the flask-type tilting barrel, said to provide increased agitation with better control.

The catalog describes tumbling barrels for deburring, burnishing, or polishing, or for combination use. Materials that can be finished include stampings, castings, and forgings in ferrous, non-ferrous, wood and plastic materials.

Charts are used to show capacities, speeds, etc., of each tumbling barrel, including direct-gear and belt-drive machines. Types of tumbling media and their job applications are listed. Also shown is a broad list of Globe Tumbling Barrel users.

METHODS FOR COMPARATIVE EVALUATION OF PAINT BONDING. A 12-page illustrated reprint of a paper prepared by Max Kronstein, Louis F. DeLong and Alfred W. Norman of the Research Division of the New York University College of Engineering is available for 35 cents from the **Office of Information Services, New York University,** University Heights, New York 53, N. Y.

This article describes methods used for comparing the paint-bonding characteristics of four types of phosphate pretreatments on steel. It also discusses tests for profile, stripping weight, and actual paint-bonding effect after prolonged salt-fog exposure, and evaluates the results obtained for each of the pretreatments used.

QUICK PIK DATA SHEET. A sheet listing directions for use of Quick Pik, a dry, acidic salt mixture for the removal of scale and rust, is available from **Mitchell-Bradford Chemical Co.,** 2446D Main St., Stratford, Conn. Five advantages of the use of the product are also listed.

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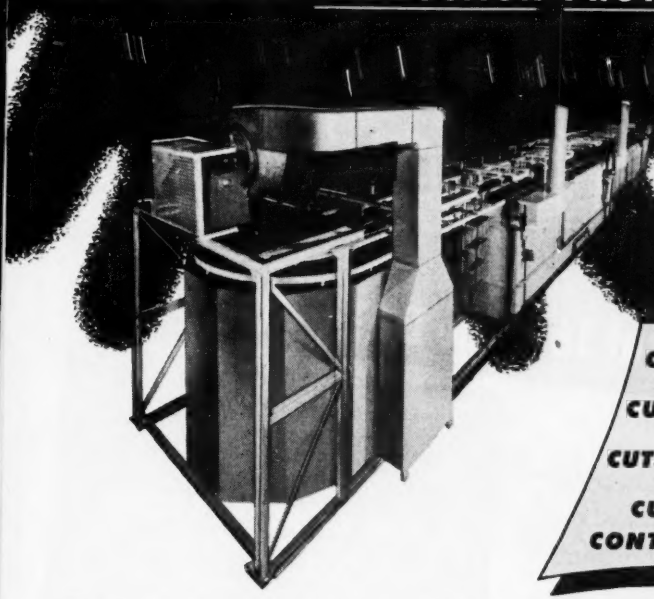

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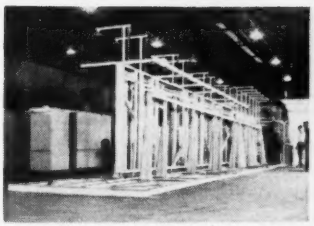

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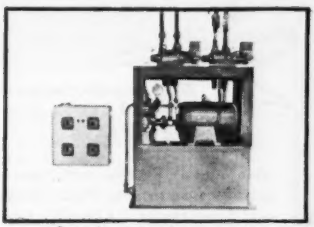

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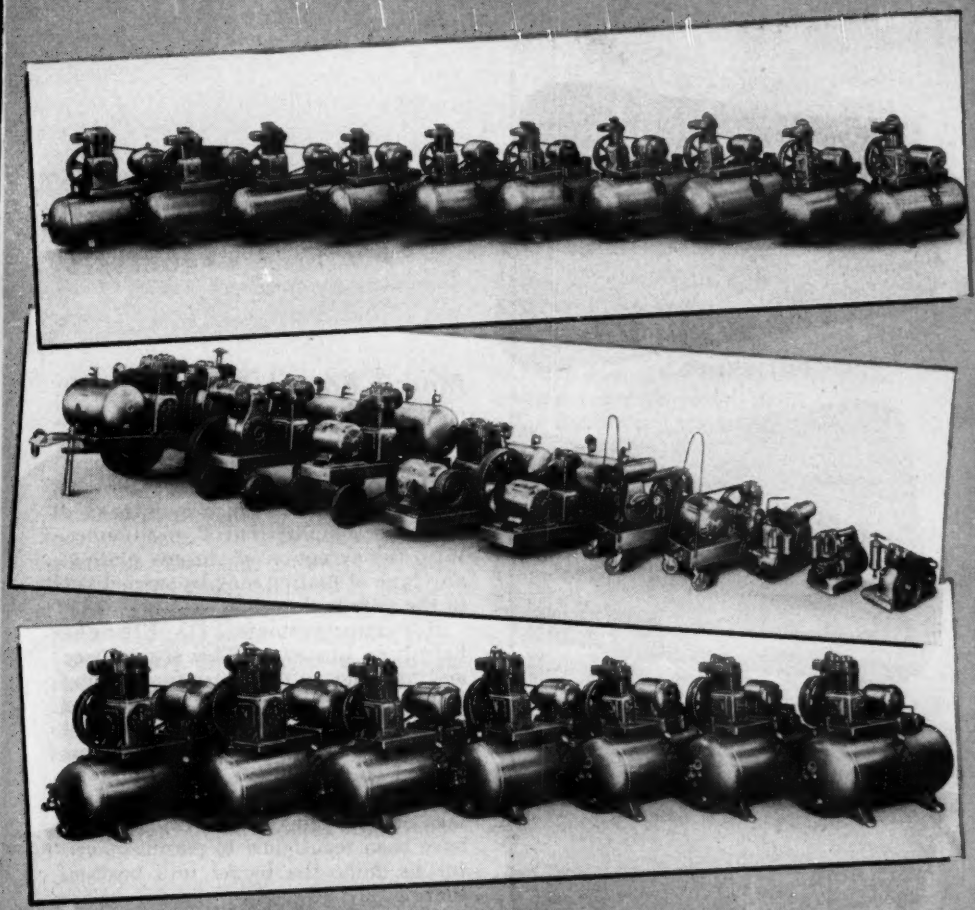

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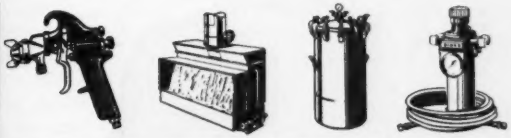

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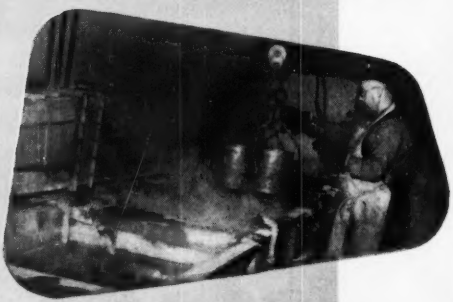

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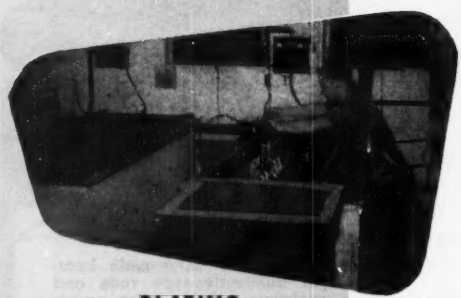

PLATING

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Mercil Barrel Plating Tank

Hanson-Van Winkle-Munning Co., Matawan, N. J., has announced an improved Mercil-type tank for barrel electroplating. The new tank is designed to save space, reduce maintenance cost and simplify barrel positioning. With the exception of chrome plating, any type of plating may be carried out in the new tank.

Key improvements: (1) Flanges have been turned in. This saves space and provides an enclosure for hanging heating or cooling coils. (2) Motor drive has been made more compact and relocated. The drive shaft is now located above solution level. Thus, no leakage is possible through shaft openings in the tank wall. (3) Saddles have been redesigned to permit operator to guide the barrel into position more easily. (4) An overflow trough is not needed and has been eliminated; thereby saving space inside the tank. (5) Now made of rigid angle-iron, the hanger assembly has been improved to assure proper alignment of the cylinder and gears.

The new tank also features a push-button type motor starter, a bottom drain, melamine bushings for insulating bronze hanger pins, flexible dangler contacts on the barrel, coil risers that extend over the top of the tank, and two anode rods for each cylinder, on single as well as multiple units. To provide equal distribution of current into a barrel, negative and positive bus bars are furnished on each end of the plating tank.

Constructed of ¼ inch double electric welded steel plate, the tank comes in two sizes—14 x 30 inches I.D. (solution capacity: 224 gal.) and 14 x 36 inches I.D. (solution capacity, 252 gal.). For acid solution, the tank comes lined with 3/16 inch vulcanized rubber, or plasticized PVC. For cyanide solutions, the tank is provided with rough wire glass in back of anodes. Tank exteriors are painted in a rust-protective gray enamel with black trim.

Melamine or Plexiglas cylinders may be used with the tank. In operation, these cylinders are completely submerged in solution. Besides more consistent plating, completely submerged barrels have 20 per cent higher load capacities and plate up to 25 per cent faster. In zinc baths, total submersion minimizes chance of a spark igniting gases above the bath.

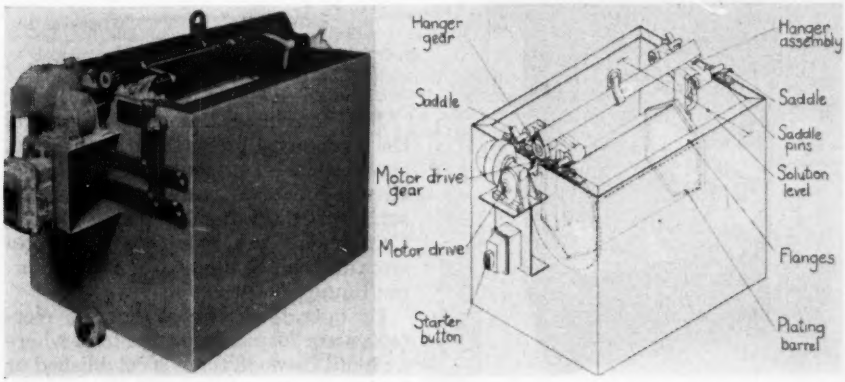
To facilitate tumbling and assure long life, the Plexiglas cylinder is constructed of a one-piece ribless mold with a specially designed convex panel arrangement inside. This barrel could be used in plating solutions up to 180 deg. F. Melamine barrels are used in solutions up to 210 deg. F.

For additional information, write to Edmund H. Hanlon, Hanson-Van Winkle-Munning Co., Matawan, N. J.

Mirror Polisher

Manufacturer: Nicholas Equipment Co., Bellevue, Ohio.

Designed for polishing any base metal or buffing any plated stock, the



Mercil Barrel Plating Tank

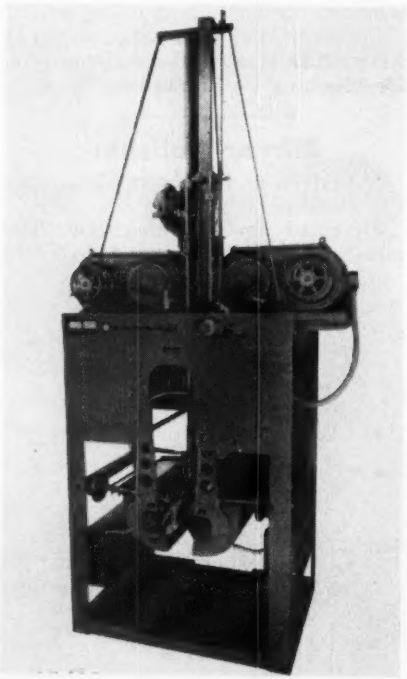
Nicholas Mirror Polisher is so designed that both sides of a flat surface may be finished simultaneously. Likewise, objects requiring finishing on one side only may be positioned back to back in the polishing machine.

The Nicholas Mirror Polisher is fully hydraulically actuated with speed of the work carriage infinitely variable both upward and downward. A stroke selector permits a pre-determined number of passes required for the finish desired. The work automatically clears the rolls after the final pass.

Front loading keeps the operator in a safe working position, with all operator controls accessible from the front. Working stroke is adjustable with simple hand-set strikes. A motor driven oscillator insures random pattern of finish. Variable speed drives permit perfect synchronization of surface speed of the rolls, resulting in extremely long buff life and ideal electrical efficiency. Constant reading ammeters indicate exact load on each motor for exact synchronization and load setting.

Hydraulic holdback cylinders accurately maintain roll pressure, permitting "impact" polishing.

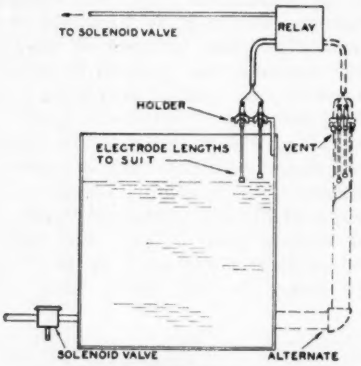
Catalog data sheets available.



Mirror Polisher

Johnson Tank Controls

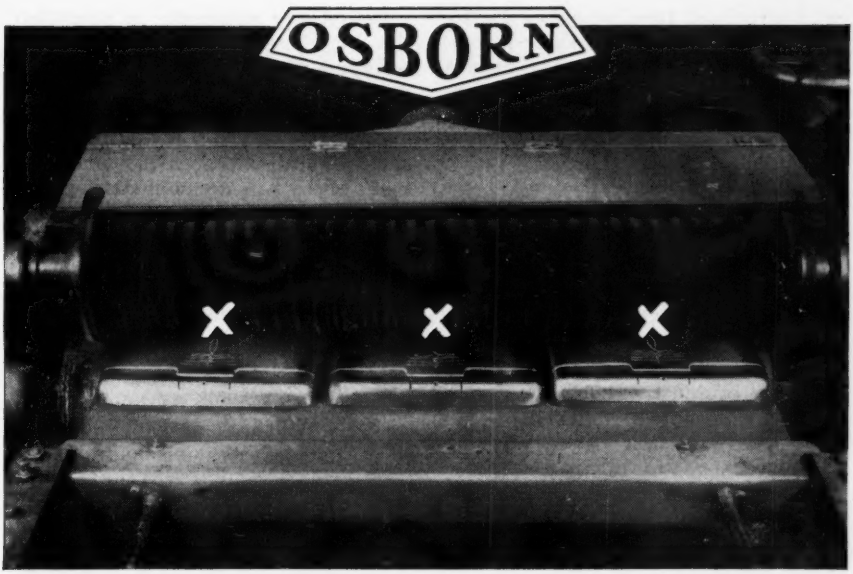
Manufacturer: Johnson Corporation, Three Rivers, Mich., manufacturer of steam specialties and boiler room equipment.



Typical installation of Johnson Tank Controls.

For simplified liquid level control the company supplies three time-tested, standardized components, a Johnson Electrode Holder, a relay, and a Johnson Direct Operated Solenoid Valve. Components are available in several sizes and can be used with many different liquids.

In operation, two stationary electrodes are suspended in the tank where a circuit between them is established or broken by the rising or falling of the liquid level. This circuit actuates the



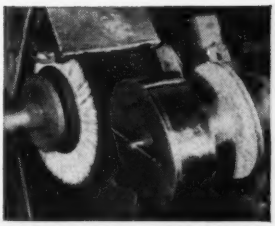
X unmarks the spot...at 1750 rpm

Heavy Presses form these waffle iron lids. But they leave draw marks on the cold rolled steel . . . marks which must be removed before the lids take their nickel plating bath.

That's when the Osborn Fascut® brushing sections go to work for this appliance manufacturer. Under those waffle-iron panels are wooden forms, attached to the table which moves the panels back and forth under the rotating (1750 rpm) Fascut brushes. A flexible back-up roll regulates the pressure during brushing.

Not only do the Fascut brushes blend away the draw marks quickly... but the panels are also finished at the same time. This eliminates a time-consuming hand-finishing operation. Now the manufacturer produces 250 panels an hour, *twice the output* before the Osborn Fascut brushing sections were adopted.

Whatever *your* product . . . metal, rubber, plastic or other material . . . it will pay you to have your **O**sborn **B**rushing **A**nalyst study your operations to suggest the money- and time-saving techniques made possible by Osborn power brushing methods. Call or write *The Osborn Manufacturing Company, Dept. O-13, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



300% greater wear is obtained from the Osborn Monarch Brushes used here than with the Tampico brushes used previously. In this push-button brushing operation, a smooth lustrous finish is produced prior to nickel plating.

FREE:
New booklet on deburring with Osborn Power Brushing. Write for your copy.

Osborn Brushes

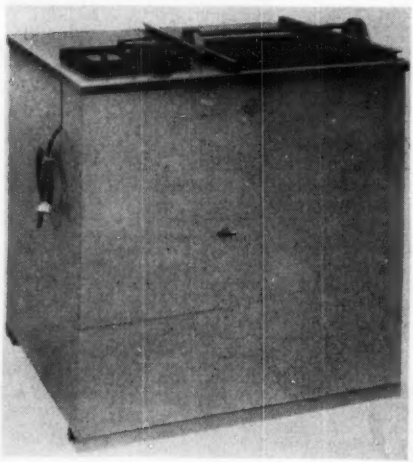
OSBORN BRUSHING METHODS • POWER, MAINTENANCE AND PAINT BRUSHES • BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

relay which, in turn, operates the solenoid valve. This valve may be installed in either the tank supply or discharge line, which ever operating conditions require for proper level control.

Jet Plater

Necessary equipment for mass production plating of precious metals or small scale laboratory pilot plant operations is combined in the new portable Jet Plater. Also incorporated in the new unit is a unique "jet" agitation action, making it available for the first time in any small-volume plating unit.

Designed for high speed plating with the Sel-Rex Bright Gold Process and Bright Silver Sol-U-Salt bath, the Jet Plater is equally useful in the laboratory for pilot plant operation with any small-volume alkaline bath. The unit can be furnished with a rubberlined or Koroseal tank for use with acid solutions. The Jet Plater is ideally suited for still plating, or it can be fitted with a portable barrel for barrel plating operation.



Jet Plater

Completely automatic in operation, the Jet Plater consists of a Sel-Rex Selenium Rectifier, of the proper output rating for the tank size; a stainless steel tank, which can be used as the anode, with a water compartment for temperature control; a movable work rack, which will accommodate a portable plating barrel; a corrosion resistant, stainless steel filter; a polyethylene, drip proof pump powered with a ¼ h.p. motor; and a "safety" tank under the plating tank, pump and filter to catch leakage or accidental spillage.

Agitation is accomplished with a "jet" arrangement at the bottom of the tank which produces continuous rapid movement of the solution. The solution is continuously filtered and pumped back into the tank under pressure.

Standard Jet Plater models have 10, 20, or 30 gallon capacity tanks. Larger units, up to 100 gallons, can be built to specification. For further information write: Sel-Rex Precious Metals, Inc., 229 Main Street, Belleville 9, New Jersey.

Agitating Parts Cleaning Machine

An industrial washing machine, just announced, features many innovations designed to make cleaning of a wide variety of miscellaneous parts quick and easy. Basically, the machine agitates a tray holding the parts through the cleaning bath, generally a solvent-type material.

A special advantage of the unit is that it is loaded at normal working level. The operator need not raise or lower parts to be cleaned, and need not get his hands near or into the cleaning solution. No hoist is required. Parts are moved directly from the plant conveyor to the "table-height" tray of the machine, and similarly removed after cleaning.

WHY PAY HEAVY OVERTIME FOR "JACK-ASS" LABOR?

PEEL SPRAY-BOOTHS CLEAN WITH "LIQUID ENVELOPE"

Save labor, promote firesafety, get better illumination. Cheaper and better than hand-scraping or grease-papering.

TEST SAMPLE OFFER
new users only—5 gallon can at the drum lot price. Order today—start saving tomorrow!

BETTER FINISHES & COATINGS, INC.
268 Doremus Avenue, Newark 5, N. J.
122 East 7th St., Los Angeles 14, Calif.

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Eastern Spray Equipment
c/o Mitchell-Love, Philadelphia, Pa.
Edgcomb Steel of New England, Inc., Milford, Conn.
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John Henry Foster Co., Minneapolis, Minn.
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Vic Miner Co., Toledo, Ohio
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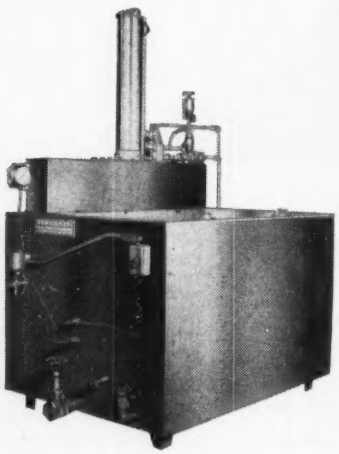
Paints & Lacquers, Inc., Chicago, Ill.
Pauli & Griffin Co., San Francisco, Calif.
Plastic Paper Co., Los Angeles, Calif.
Porter Paint Co., Louisville, Ky.
Protective Prod. Distributors, Hamburg, N. Y.
R. W. Renton and Co., Cleveland, Ohio
Hugh Russell & Sons, Ltd., Montreal, Can.
Scobell Chemical Co., Rochester, N. Y.
Sprayway Co., Los Angeles, Calif.
Supplee-Biddle-Steltz Co., Philadelphia, Pa. (Industrial Division)
Tanner and Co., Indianapolis, Ind.
Tri-State Spray Equipment & Compressor Co., Omaha, Neb.; Rock Island, Ill.
In Europe:
Jenson & Nicholson, Ltd., London, Eng.

At loading position, the tray is raised to the top of the tank, out of the cleaning solution. As it is level with the side of the machine, parts may be loaded directly and easily from a roller conveyor or other means. Parts may be loaded on the tray separately or in baskets, depending on size.

After loading, the operator presses a button which starts the machine. The tray sinks into the tank to operating level, where it is pneumatically "sloshed" up and down at the rate of 40 strokes per minute. The combination of the motion and the cleaning solution effects a clean surface in a remarkably short time, even with heavy deposits of soil.

At the end of the cleaning period (or automatically, if desired), the tray is raised to the loading position again and the clean parts removed onto the plant conveyor. The pneumatic mechanism is the only moving part on the machine; it operates at 100 psi.

The tank can be operated cold or heated with steam, gas, oil or electricity. Temperature control is provided to hold tank temperature at any point between 80 and 212 deg. F. Maximum size of the machine is 6 feet long, 4 feet wide and 42 inches high; smaller sizes are made as required. The parts tray is designed for a maximum load of 400 pounds.



Agitating Parts Cleaning Machine

The tank is made of 10 gauge steel and may be insulated to conserve heat or for use in air conditioned plants. The tank lid is hinged and provided with a 160 deg. F. fusible link for automatic closing in case of fire, when flammable solvents are used. Further details on the Cincinnati Agitating Parts Cleaner are available on request from the manufacturer: The Cincinnati Cleaning and Finishing Machinery Co., 2008 Hageman St., Sharonville, Ohio.

All-Weather Powermastic Heater

The Spee-Flo Co., 720 Polk Ave., Houston, Texas, manufacturer of industrial and automotive hot-spray heaters, has announced the Powermastic, newest member of a family of protective finish heaters.

Heavy asphaltum and mastic materials may be sprayed smoothly, rapidly and virtually unaffected by cold weather, with the Spee-Flo Powermastic heater. Because most coatings of this type become very viscous in cold weather, the spraying becomes difficult, the atomization poor, and both the quality and production speed suffer greatly.

The portable Powermastic heater, weighing less than 40 pounds, is placed in the material line approximately 25 feet back of the gun, to provide the maximum mobility for the operator. The material is pumped through the efficient and maintenance-free heater, reaching the gun at a viscosity lower than could be expected on an ideal summer day. The viscosity reduction permits application with lowered air pressure, which eliminates gun blast

The Hardy Mfg. Co. of Indiana uses the above equipment and the SMOOTHEX Process to increase their plating production.

EVERY USER OF THE NEW SMOOTHEX BRIGHT COPPER PROCESS* Has Increased Production!

You can do it too with this new, revolutionary, high-speed process. It's easier to control, faster and more economical in both large scale or average job shop production. You can achieve top quality more profitable plating solutions and increase your production by using your present equipment.

SMOOTHEX Assures Maximum Brightness • Throwing Power • Plating Speed

It provides an instant sparkling brilliance that occurs at the beginning of the plating cycle in a Rochelle Cyanide Copper Solution. It has exceptional speed of deposition and excellent throwing power. Brightness is achieved over a much greater range . . . from zero to eighty amperes per square foot. Ductile deposits and low copper concentrations are featured in this process. Periodic reverse or intermitting current may be applied to the SMOOTHEX process.

The SMOOTHEX Process Is

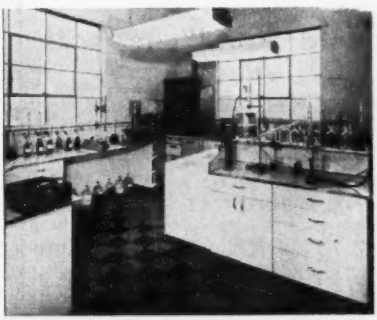
98% **EFFICIENT**

IT ELIMINATES COPPER BUFFING and SAVES NICKEL.

HAS • EASE OF CONTROL • INSTANT SPECULAR BRIGHTNESS • LOW MAINTENANCE COST • LOW OPERATING COST • ADAPTABILITY

Send Your Sample Solution for Conversion Information **TO**

*Pat. Pend.

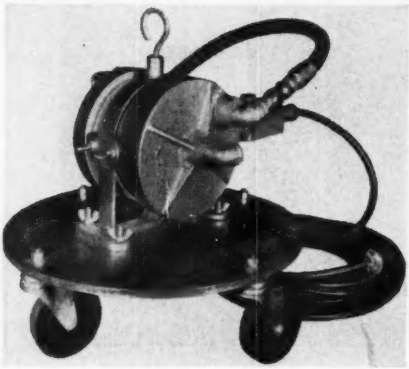


A Modern, Well-Equipped Laboratory Is at Your Service to Convert Other Processes to SMOOTHEX.

SMOOTHEX, inc.

10705 BRIGGS ROAD
CLEVELAND 11, OHIO

EXCELLENT TERRITORIES STILL AVAILABLE



Powermastic Heater

and overspray and produces a smoother, more uniform finish. Heated material may be applied almost twice as rapidly with no tendency to sag, which produces marked labor saving. Drying time, quality and speed are improved and air volume requirements are reduced. The Powermastic may be attached to any standard 110 volt AC outlet, and promises to be a most valuable tool for the protective coating industry.

Cold Metallizing with Aluminum

A material which makes it possible to metallize surfaces with aluminum without the use of heat has been announced by Emjay Maintenance Engineers, Rutherford, N. J. The process is based on the development of a material called Kolmetal,* a mixture of finely pulverized aluminum in a plastic base. The resultant coating, achieved by two applications of Kolmetal with a four hour drying time between applications, air hardens to a plastic bonded aluminum surface which can be polished, ground, drilled or bent to a 45 degree angle without chipping or cracking.

Kolmetal has excellent resistance to atmospheric and sea water corrosion. It retains its finish and firm adhesion over a wide range of temperatures and demonstrates complete inertness to a long list of foods, beverages and liquid products.

Kolmetal is recommended as a coating for the interiors of all types of tanks — both to prevent the contents from contamination and to protect the interior from corrosive action of the contained liquid. It proves an excellent exterior coating for acid cooling coils since it has practically no insulating effect, and it is ideal for the protection of structural iron and steel, ducts and piping and a variety of industrial equipment and machinery.

Comparison of cooling coils after two years of service in salt river water with a pH between 4 and 5. Coils on left, coated with Kolmetal, are free from scale, salt, algae or corrosion products of any sort. Those on the right, which were uncoated, show heavy buildup of rust, scale, and organic growth.

* Registered Trade Mark

for batch or continuous production

KIRK AND BLUM industrial ovens

• **Save Space** • **Speed Production** • **Improve Quality**

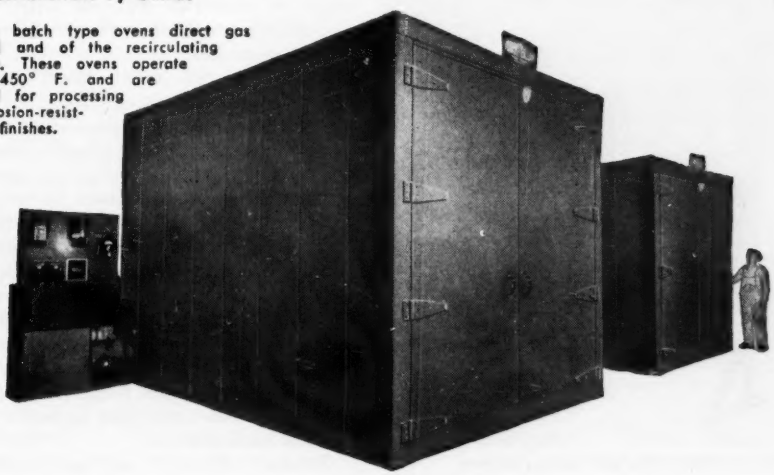
Compactly designed and expertly engineered to meet specific production requirements, these recent installations illustrate KIRK & BLUM Ovens built for many uses.

From mammoth conveyor ovens for high production to the smallest laboratory units, KIRK & BLUM Industrial Ovens are equipped with complete temperature and safety controls to assure performance . . . to insure quality results.

Many ovens are shipped complete from the new KIRK & BLUM plant, ready to use as soon as necessary connections are made.

Write for booklet, "Industrial Ovens," showing other typical installations. The Kirk & Blum Mfg. Co., 3116 Forrer Street, Cincinnati 9, Ohio.

Two batch type ovens direct gas fired and of the recirculating type. These ovens operate at 450° F. and are used for processing corrosion-resistant finishes.



Immersion Tin

The Enequist Chemical Co., 100 Varick Ave., Brooklyn 37, New York, has announced commercial availability of a fast depositing, white color, immersion tin process.

The process is operated at a temperature of 75-85 deg. F. in plastic, glass or stainless steel, tanks or crocks. A uniform deposit is obtained in 2-3 minutes, with mild agitation. No electric current is used.

It is also applicable for anti-friction uses, electrotypers (eliminating tinfoil and tin electroplating) electronic parts, wire and sheets.

Electric Radiant Heating Element

An electric radiant heater, said to emit rays in the far-infrared field, has been developed by Cleveland Process Co., 1965 East 57th St., Cleveland 3, Ohio.

Electric Radiant Heating Element

General applications of this heater include a wide variety of uses such as baking, curing, drying, plasticizing and other heat processing where temperatures of 400 to 500 deg. F. are required. On applications such as heat treating, carburizing, and so on, where higher temperatures are required, heaters with ratings up to 1600 deg. F. can be supplied.

According to the manufacturer, a single heating unit consists of a fused quartz tube, 48 inches long, in which is encased a heavy duty nickel-alloy heating element. The element is completely sealed and supported its full length inside the rigid quartz body and cannot sag, warp or stretch and cause short circuiting. The fused-quartz tube is acid-proof; vapors cannot enter and deposit carbons that might result in shorts and heater failure. Each heating element has an individual stainless steel reflector in which it is firmly secured by a supporting and connection bracket at each end. Radiant heater panels and assemblies are made up from multiples of these units. Capacities of individual units range from 100 to 1000 watts per linear foot.

The heaters are available in single units or multiple sections with various panel arrangements for complete oven assemblies.

Many special applications revolve around the inertness of Clepco radiant heaters to corrosive vapors such as occur in chemical and plastic process work. They are reported to provide greater safety in processes involving a volatile by-product since the temperature of the heating elements does not exceed oven temperature and cannot reach the flash point of surrounding volatiles. Other applications utilize the lack of heat lag, the manufacturer claiming that this heater has rapid acceleration and quick response to automatic controls—resulting in better processing methods.

Heating efficiency and uniformity is

It's always Dirty Weather in Parker's torture chambers

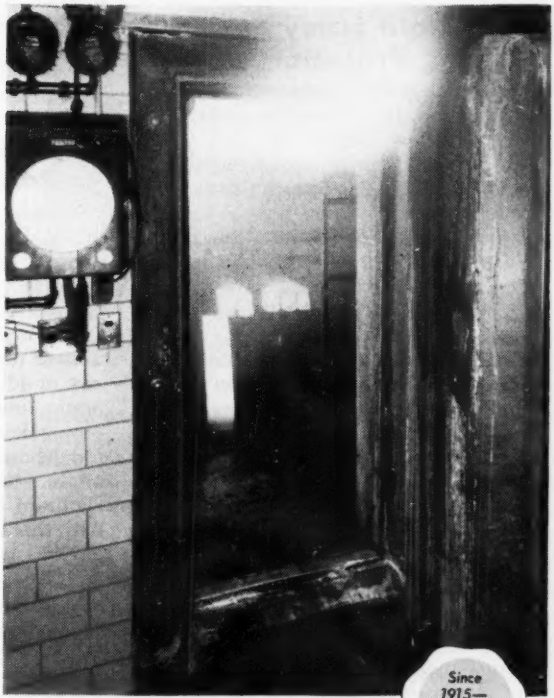
We operate three torture chambers in Detroit. They are the accelerated testrooms, where we can concentrate in days or weeks what will happen to a product's finish in years of service life.

The rooms are always full. Full of test panels and customers' production pieces undergoing the humidity and salt spray to see how their finishes stand up.

Here we can show a manufacturer how much protection he gets with a Parker product such as Bonderite or Parco Compound. We can check a customer's production-treated part against a laboratory-treated part. We test our new products, our improved products – and our old products – to be sure that our high standards are maintained.

The accelerated test program is one of many unmatched services offered to Parker customers and prospects. It's another reason for you to *call on Parker for quality surface treatments for metals.*

*Bonderite, Bonderlube, Parco, Parco Lubrite — Reg. U. S. Pat. Off.



Since 1915— leader in the field

PARKER

RUST PROOF COMPANY

2172 E. Milwaukee, Detroit 11, Mich.

BONDERITE	BONDERITE and BONDERLUBE	PARCO COMPOUND	PARCO LUBRITE
corrosion resistant paint base	aids in cold forming of metals	rust resistant	wear resistant for friction surfaces

said to be greater because the far-infrared radiation has no "hot or cold" spots and is more readily absorbed by the materials and substances being heated.

Clepco Radiant heaters are now being manufactured in a series of standard lengths and capacities.

Zipcote Spray Booth Protector

Manufacturer: Adhesive Products Corporation, 1660 Boone Avenue, New York 60, New York.

When applied to spray booths or turntables Zipcote Spray Booth Protector prevents paint and adhesives from sticking to the walls of the booth. The accumulation of sprayed materials can then be readily peeled off, saving many man hours of work. It can also be applied to work tables used for gluing.

Zipcote Spray Booth Protector is non-flammable, and can easily be applied by brush or spray. Spray booths or turntables can be used immediately after application.

Supertartral

Lea-Ronal, Inc., 42-46 27th Street, Long Island City, New York, has announced the release for precision and commercial copper cyanide plating purposes of Supertartral. an additive that offers distinct operating values over Rochelle Salts and other tartrates, resulting in better, faster, and more economical plating.

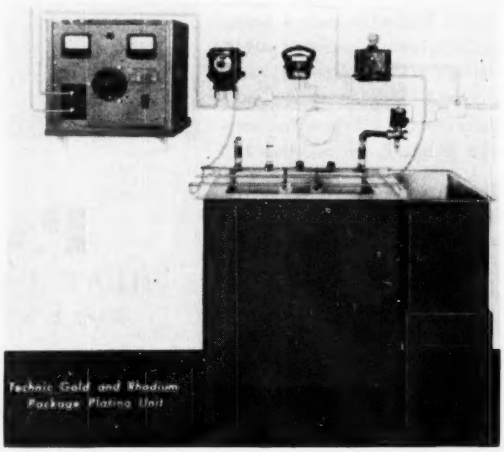
Supertartral provides: superior anode corrosion; greater solution tolerance to numerous metallic impurities, chromium, calcium, barium, magnesium; better deposits with less tendency to roughness caused by such metallic impurities as might be introduced by hard water; reduction in operating costs when used at recommended concentration; better cyanide stability because it reduces cyanide breakdown with its resultant carbonate formation.

Lea-Ronal Supertartral has been thoroughly tested in production volume in all methods of plating. Free samples for laboratory testing purposes can be obtained on request from the manufacturer.

Technic Gold and Rhodium Package Plating Unit

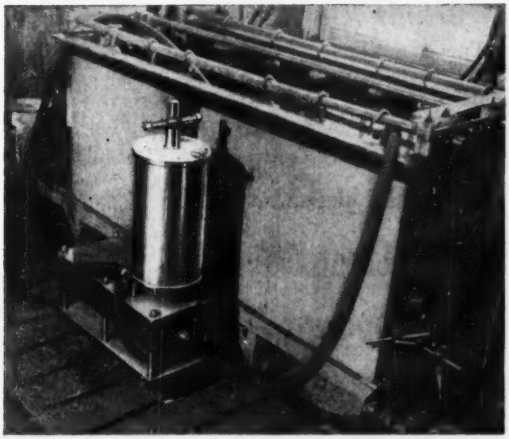
Technic, Inc., 39 Snow St., Providence, R. I., has announced the development of a complete fully controlled package unit for the precision plating of gold and rhodium.

The unit, suitable for other specification or decorative plating, has a capacity of 40 gallons and offers fully automatic timing, heat control, individual power source and indicating metal replenishment control. Technic, Inc. also offers standardized soluble gold and rhodium of the highest purity for use with this unit. Technic, Inc. is prepared



Here's how to cut your losses

get better finished plated work — save time and labor



The *"Sealed-Disc"* Filter will remove all dirt, dust, and sludge from your plating solutions. You will no longer worry about pitting, spotting, poor adhesion, formation of nodules, etc.

More and more platers testify to the remarkable savings in operating time and labor that the *"Sealed-Disc"* Filter gives them. These cost-minded platers get better finished plated work and have found that their solutions last l o n g e r. *"Sealed-Disc"* Filters, designed to meet plating room requirements, are smaller, more compact and portable, than ordinary conventional filters.

Regardless of the size or type of your installation, there's a *"Sealed-Disc"* Filter to "fit your job". You can depend on a *"Sealed-Disc"* Filter for positive, trouble-free performance that's proof against even the invisible impurities that cause nodules and porousness, proof against losses caused by rejects and reworking. Write for complete details or contact your regular plating supplier.

ALSOP

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Other Alsop Plating Room Equipment

We manufacture a full line of Mixers and Agitators covering a complete range of sizes, for mixing, blending, and dissolving. Stainless Steel Mixing Tanks are also available in a wide range of capacities. For full details and illustrations write for your free catalog.

to detail the procedure for plating any thickness of gold, gold alloy or rhodium including full analytical procedure. Full engineering service is available.

Bright Nickel Process

The Unichrome Bright Nickel process has been made available to the plating industry of the United States. The process, which was developed in the United Chromium laboratories, has been completely tested and field proved in commercial operations. Many thousands of gallons of Unichrome Bright Nickel have already been used in a wide variety of industrial nickel plating applications in this country and Canada.

The introduction of Unichrome Bright Nickel, important in itself, nevertheless has a significance beyond its effects on nickel plating alone. Its availability makes possible for the first time the achievement of unity in producing decorative chromium finishes. It can eliminate the need for treating copner - nickel - chromium finishing as three separate and distinct operations, each with its own service and responsibility problems. Now the plater can assure uniformity and singleness of service responsibility by employing three proved plating processes all developed and serviced by a single organization. Unichrome Copper, Unichrome Bright Nickel, and Unichrome SRHS Chromium are already being used as a production team by a number of prominent manufactur-

On any steel blackening problem

DEPEND on DU-LITE for a Superior Finish

Courtesy The Poly Choke Co.

Here's an example . . .

Du-Lite gave this part with its complicated knurls, slots, threads, etc. a fine rust-resistant durable black finish. It is typical of many other parts, small and large, which have been black oxidized by Du-Lite for many years. Moreover, Du-Lite meets most individual and government specifications including 57-0-2C for Type III Black Oxide finish.

What's YOUR problem?

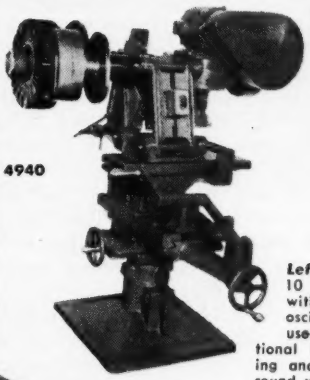
Du-Lite installations are simple, compact, easy to operate. Du-Lite equipment can be tailored to fit production requirements on all types of jobs with a maximum of speed and economy. Du-Lite also makes a complete line of cleaners, strippers, wetting agents, passivating agents, rust preventatives, burnishing compounds, etc. for any metal finishing application.

See your nearest Du-Lite Field Engineer or write for more information.

Du-Lite DU-LITE CHEMICAL CORP. MIDDLETOWN • CONN.

METAL FINISHING SPECIALISTS

ACME *Semi-Automatics* CUT COST!



4940

5010-2-9

Left: ACME Type D-10 Semi-Automatic, with stroke . . . an oscillating machine used with conventional lathe for polishing and buffing out-of-round work. Work oscillates across face of wheel.

Above: ACME Type B-10 Semi-Automatic with patented geared chuck used with two ACME L-8L adjustable buffing lathes for finishing all four sides and top of rectangular or out-of-round parts in one operation.

(CATALOGS ON REQUEST)

for PROVED PERFORMANCE
Install ACME *Automatics*

Nearly half a century of progressive experience in this specialized field enables ACME to serve you well. ACME Automatics have an impressive background of proved performance in polishing, buffing, grinding, wire brushing, de-burring and micro-finishing in civilian and defense production. Radius blending, armor plate grinding, thread clearing and automatic indexing of many operations as well as automatic polishing and buffing of all sizes and shapes of parts are handled efficiently by ACME Automatics.

For recommendation, send blue prints of part or samples before and after finishing, with detailed information on finishing operations and production requirements. If production methods will cut your costs, we can set your job up in our experimental department and you can inspect it in operation.

ROTARY STRAIGHT LINE SEMI-AUTOMATIC AND SPECIAL *Polishing and Buffing Machinery*

SPECIAL MACHINERY — AUTOMATIC BUFFING MACHINES

ACME *Manufacturing Co.*

1400 E. 9 MILE RD., DETROIT 20 (Ferndale) MICH.

Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR NEARLY HALF A CENTURY

ers. For each, the result has proved to be increased operating efficiency and greater economy.

Ease of control, stability, superior receptivity for chromium deposits, and, above all, economy are the major advantages of Unichrome Bright Nickel. Platers have been most impressed by the stability of the primary brightener over a wide range of pH and other operating conditions, this stability resulting in lower, more economical rate of replenishment, also simplification of control.

High solubility is a characteristic of the addition agents. In many installations Unichrome Bright Nickel has helped solve problems connected with low brightener solubility. It has, for example, minimized problems of brightener drying out on the work and brightener crystallizing on tanks and equipment after cooling of the plating solution. This solubility and the use of all-liquid addition agents have made maintenance of Unichrome Bright Nickel easier and less time consuming.

Unichrome Bright Nickel provides a superior base for chromium plating. Exhibiting excellent receptivity for chromium deposits, Unichrome Bright Nickel has significantly reduced "gray plate rejects" in numerous installations. It has been found that bright chromium can be deposited without activation on Unichrome Bright Nickel deposits which have been exposed to the air for as long as several hours. Unichrome Nickel deposits are also whiter in color, and, for this reason, subsequent chromium deposits appear to have greater sparkle, and chromium "misses" become less obvious.

Superior tolerance for metallic and organic contaminants has been reported by users of the process. As a result, Unichrome Bright Nickel is being operated with less frequent purifications.

Deposits from Unichrome Bright Nickel exhibit high brilliance. The solution has a good rate of brightening. Other properties confirmed by commercial experience are very good protection against corrosion for the basis metal, good ductility, and very low internal stress of the deposits. Tests conducted by a major automotive manufacturer showed the internal stress of Unichrome Bright Nickel to be negative, indicating superior resistance to cracking of the deposit in service. Excellent adhesion of deposits has been the experience in all installations.

The Unichrome Bright Nickel solution has a nickel sulfate, nickel chloride, boric acid composition with special Unichrome addition agents. Most nickel plating solutions having a typical Watts formulation can be converted to Unichrome Bright Nickel.

Additional information about Unichrome Bright Nickel may be obtained from United Chromium, Incorporated, 100 E. 42nd Street, New York 17, New York.

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automatic-pneumatic.
SPRAYING MACHINE
• PORTABLE
• DRIVEN SOLELY BY AIR PRESSURE
Production up to 1000 pieces per hour.
Uses regular exhaust booth.
Only one operator is needed to load unfinished and remove finished work.
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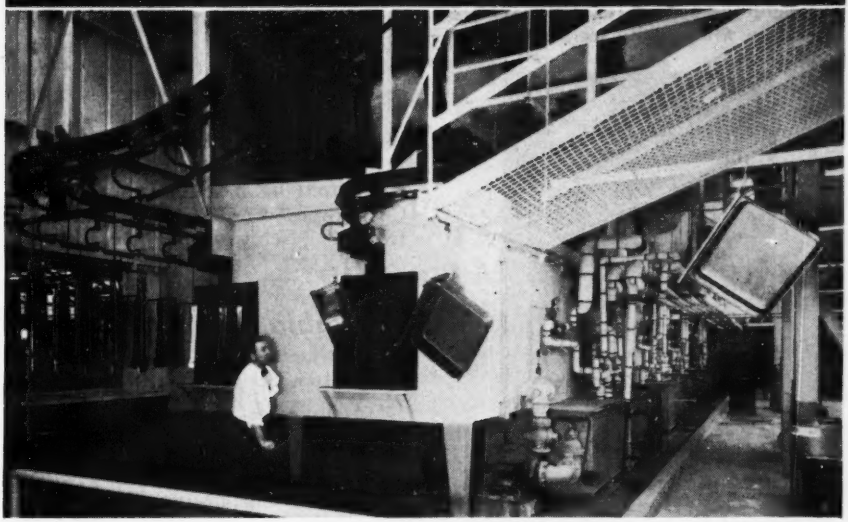

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KOCH BUILDS:

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- COMPLETE FINISHING SYSTEMS FOR BOTH WOOD AND METAL
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When you make KOCH responsible, you're assured of a perfect dove-tailing of all components, preventing costly reworks and last-minute changes.

The result is a high-production, low-cost operation that will pay you dividends from the day it's installed.

WRITE FOR FOLDER 12!

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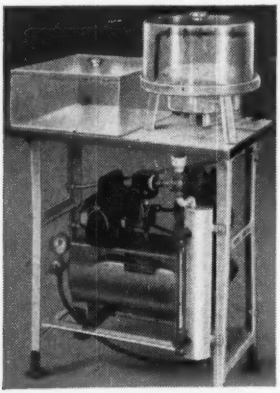
EVANSVILLE, INDIANA

Lucite Salt Spray Tester

Convenient observation of salt spray corrosion tests can be achieved through machines with Lucite testing compartment and salt solution reservoir developed by Belke Manufacturing Company, 947 N. Cicero Ave., Chicago 51, Ill.



Lucite Salt Spray Tester

In operation the machine continuously subjects articles in the testing compartment to a salt spray fog at room temperature.

Designed for laboratory use, as well as for running small parts and samples, the machine is completely self-contained and attractively finished.

The salt spray testing compartment is approximately 13½ inches in diameter x 8 inches high. The salt solution reservoir is approximately 15 x 16½ x 7 inches. Literature on request.

Econocote

Metasurf Corporation, Detroit, Michigan, has announced a new product known as Econocote.

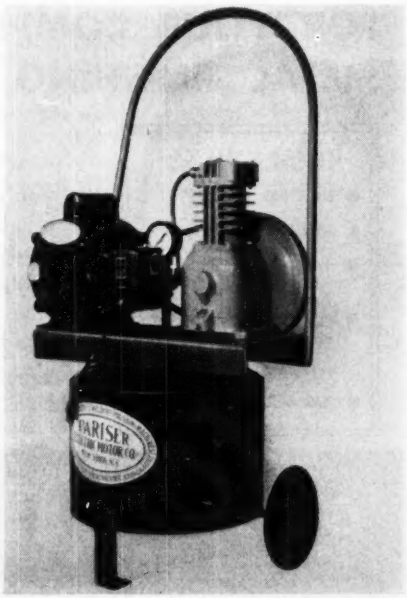
Probably its most unique feature lies in the fact that no rinse is required. It can be used in a single-stage spray washer for both cleaning and phosphatizing. Besides having exceptionally good cleaning characteristics, Econocote creates an iron phosphate coating of between 25 and 40 mg. per square foot. It can be used for treating steel, cast iron, aluminum or zinc, and substantially improves paint adhesion.

Complete information on Econocote is contained in a new 4-page folder which may be obtained from Metasurf Corporation, 12830 Eaton Avenue, Detroit 27, Michigan.

Portable Air Compressor

Manufacturer: Pariser Machinery Corp., 165-7 Centre St., New York 13, N. Y.

A sturdy, compactly designed portable air compressor called the "Porto-air," has been developed by Pariser Machinery Corporation for fast work



Portable Air Compressor

Not Only Chemicals
But "Know How" Too
When
You Buy...

SURPHOS

The Metal Phosphating Chemical
that Prepares Metal for Painting

SURPHOS

Is Easier to Use:

dissolve in hot water to a concentration of one ounce per gallon and apply to metal by dipping or spraying. Acid proof equipment not needed.

SURPHOS CLEANS . . . FORMS PHOSPHATE COATING . . . PREVENTS RUSTING DURING STORAGE . . . IMPROVES ADHESION OF PAINT . . . INCREASES HUMIDITY and SALT SPRAY RESISTANCE of PAINT

Our Experts Will Help You "Set Up" Your System and KEEP it working . . . .

INDUSTRIAL CHEMICAL PRODUCTS CO.
3778 BELLEVUE AVENUE DETROIT 7, MICH.

on medium size paint jobs. The Porto air unit is mounted on a dolly for quick and easy movement in factories or industrial plants. The unit consists of a 7 gallon welded steel tank and a compressor driven by a ¼ h.p., 115 volt motor, mounted on a welded steel dolly fitted with rubber tired wheels.

Test Chamber

A line of multi-range, all-purpose test chambers capable of producing low temperatures to -130 deg. F., high temperatures to 290 deg. F. and a standard humidity cycle of 20 to 95 per cent from 35 deg. F. to 185 deg. F., has been introduced by Murphy & Miller, Inc., 1326 South Michigan Avenue, Chicago, Illinois.

Made in 5 sizes with test space capacity from 4 to 36 cu. ft., the new units incorporate many features designed to provide faster, easier and more accurate testing.

A high capacity, low velocity forced air circulation system provided by a fan whose motor is mounted outside the cold test space, reduces temperature variation in all parts of the test space to an absolute minimum. Cabinets are heavily insulated with non-setting, low conductivity material. Welded seams on the heavy gauge steel exterior panels assure positive vapor sealing of the insulation. Test spaces are stainless steel, with welded watertight seams and include as standard, four ⅝-inch I.D. sleeved openings for introduction of electrical leads and hydraulic lines. Another feature furnished as standard is an electric defrost system complete with safety controls. This feature prevents condensation on products being tested by increasing their temperature to ambient before removal from the test space.

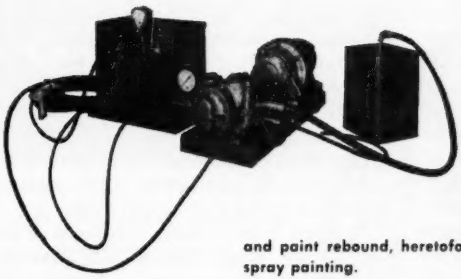
Test Chamber

A heavy duty electrical system with all major circuits separately fused is monitored by individual pilot lights and switches mounted on the master control panel. Control circuits are interlocked with the fan and defrost cycles to assure smooth, trouble-free operation. Compressor safety switches, overload protectors and automatic pump down control are other standard features. Automatic drain valves are furnished as standard when a humidity cycle is incorporated with a low temperature cycle.

The refrigeration system in the new Murphy & Miller units is composed of a heavy duty, water-cooled, hermetically sealed, compressor-motor assembly of standard manufacture. Cooling coils are all copper with welded connections, and the design incorporates a high ratio of prime to secondary surface and eliminates any possibility of oil trapping.

The units are completely internally wired, piped and laboratory tested before shipment. Connections to plant water and drain connections may be made with simple flexible connections. Many optional features such as Pro-

BEDE AIRLESS SPRAY PAINTING



a REVOLUTIONARY approach to industrial finishing with straight HYDRAULIC PRESSURE!

WITH IMPROVEMENTS AND PERFECTION IN EQUIPMENT CONSTRUCTION!

The revolutionary **BEDE AIRLESS SPRAY PAINTING** (sought after for years by pioneers and leaders in the paint industry) eliminates the waste, inefficiency and health hazards due to overspray and paint rebound, heretofore regarded as naturally inherent with spray painting.

This—the first of three major new developments for the paint industry—is the most important advancement in the history of paint application . . . another example of Bebe Leadership.

HOW IS IT DONE?...

It's a new principle, harnessing heat and hydraulic pressure, no compressed air is used. Heat lowers viscosity and builds up vapor pressure. Solvent is used as an aid to complete atomization. With especially designed, patented equipment, paint is siphoned from container into the system by electrically driven hydraulic pump, sent through a heater, to a new, lightweight spray gun, where volume and angle is controlled by selection of nozzle. **PATENT PENDING ON PROCESS.**

WHAT ARE THE BENEFITS?...

- Obtains better paint coverage with less time, labor and material, even over surface irregularities, pockets or trapped areas.
- Eliminates paint loss due to overspray. *(As much as 50%)*
- Eliminates health hazards, caused by overspray and paint rebound into sprayers face.
- Eliminates need for water-wash spray booths.

ELIMINATE WASTE IN SPRAY PAINTING!
INCREASE PRODUCTION, YET LOWER YOUR COSTS!

For informative literature, contact your local Bede distributor, or

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BEDE AIRLESS SPRAY PAINTING

gram Control, Recorder - Controller, Electrical Terminal Pads, Hand Hole Ports, Glass Viewing Window, are available with the new units.

Bronze Plating Process

A readily - controlled process for bronze-alloy plating has been developed by electrochemical engineers at Battelle Institute, Columbus, Ohio. Laboratory studies, backed up by plant operations, demonstrate several engineering and decorative applications for it.

In one application, hydraulic pumps are now produced by applying adherent bronze electroplates to bearing surfaces. Bronze plated steel and bronze plated iron castings furnish an excellent combination of good bearing properties, high strength, and simple design.

In other applications, bronze plate produced by the process has been shown to be an excellent material for facing valve seats. The process also provides a fast and easy method for depositing bronze-alloy plate for use as a stopoff against the penetration of nitrogen gas in the nitriding process for surface hardening.

The bronze-alloy deposit produced by the process is nearly three times as hard as copper plate, yet it is deposited in a ductile condition. Its structure is uniformly fine grained.

There are three compositions of the copper-tin bronze-alloy deposit recommended for different purposes. One composition produces a ductile plate, Knoop hardness 260-280, particularly effective as a bearing overlay.

Another is a slightly harder, gold-yellow plate that buffs easily to a mirror finish and is an excellent undercoat for decorative plating. Chromium can be plated directly on this plate after buffing, or after depositing a very thin bright nickel plate. This composition plus chromium has been superior to an equal thickness of copper plus chromium in protecting steel against corrosion.

A third composition produces a silvery, very hard (about 400 Knoop) plate unusually resistant to tarnish and scratching. It is excellent for inside automotive hardware and architectural trim, for flatware and reflectors.

The patented process (known as Lustralite) was developed at Battelle under the sponsorship of The City Auto Stamping Company, Toledo, Ohio. Columbus Metal Products, Inc., Columbus, Ohio, set up the first commercial installation and with it has produced much work for the Denison Engineering Company, also of Columbus, hydraulic press and pump manufacturers.

Distributors of Lustralite are:
L. H. Butcher Company
3628 East Olympic Boulevard
Los Angeles 23, California

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SPRAY BOOTHS - Systems

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PAINT SPRAY FINISHING SYSTEMS
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GLOBE DIRECT DRIVE TILTING BARREL

Controls Tumbling for . . .

- **BIGGER LOADS**
- **FINER FINISH**
- **LOWER COSTS**

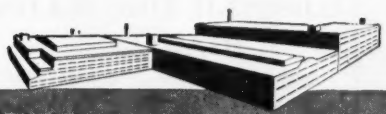
Available in Kiln-Dried Maple or Steel Shells

Globe tilting barrels save labor and time because they will take bigger loads and finish them faster. In many instances use of Globe Precision Barrels has eliminated costly hand operations. Globe's exclusive "work shifting" bottom gives complete agitation for uniform high-quality work.

Low speeds for non-ferrous and plastic parts assure quality finish without scratching or marring.

FREE EXPERIMENTAL SERVICE

Hupp's experimental laboratory is at your service. Send samples of parts to be processed and finished part. Hupp will analyze your finishing needs and make cost-saving recommendations. No charge or obligation. Write Today.



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Hydrite Chemical Company, Inc.
605-621 South 12th Street
Milwaukee 4, Wisconsin
Scobell Chemical Company, Inc.
Rockwood Place
Rochester, New York
Union Screen Plate Company of Canada, Limited
Lennoxville, Quebec
Canada

PRODUCT LITERATURE

In requesting copies of catalogs or bulletins mentioned in this issue — use the READER SERVICE CARDS between the covers.

ELECTRODEPOSITION OF HARD NICKEL. A 16-page reprint of a paper by W. A. Wesley and E. J. Roehl, presented at the 82nd General Meeting of the Electrochemical Society, is available from **International Nickel Co.**, 67 Wall St., New York 5, N. Y.

Illustrated with photo micrographs, charts and tables, the paper covers deposits of a hardness of 380 to 480 Vickers, in thickness and quality suited to industrial and engineering applications. Explained is the use of a nickel sulfate electrolyte containing ammonium salts and boric acid which produces heavy deposits, free from laminations, sound in structure and of a high order tensile strength (157,000 p.s.i.) coupled with measurable ductility (6 per cent).

It is pointed out that a high current efficiency, good throwing power and a high rate of deposition are advantages which reduce the cost of heavy nickel deposits.

LIST OF BRISTOL PRODUCTS. BULLETIN W1805, available from **The Bristol Co.**, 127 Bristol Rd., Waterbury 20, Conn., lists not only the complete line of gauges, controllers and recorders, flow meters, bridge instruments and instrument panels, produced by the company, but also the branch offices, including addresses and telephone numbers. Bulletins on the products listed in **Bulletin W1805** are also available from The Bristol Company.

PLATING RECTIFIER DATA SHEET. Available from **Electronic Rectifiers, Inc.**, 2100 Spann Avenue, Indianapolis 3, Ind., is an illustrated data sheet describing the **LEKTRON PLATING RECTIFIER.** The two types of Lektron Plating Rectifiers (Lektron Selenium and Lektron Magnesium-Copper Sulphide) are described in the data sheet. Operating characteristics, available ampere and voltage ratings, and operating advantages are included in this literature.

CHEMSTEEL CONSTRUCTION COMPANY, INC.
301 Chemsteel Bldg. Walnut St., Pittsburgh 32, Pa.

Send data on Engineering & Construction facilities for
ACID-ALKALI-PROOF CONSTRUCTION
of processing & storage tanks & flooring in
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ELIMINATE ZINC PLATING HEADACHES
by purifying your solution with
McKeon's Zinc-Brite
Write for complete information.
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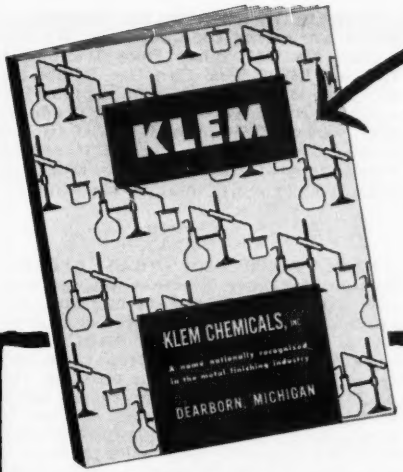


Write for this catalog — describes 31 standard surface preparation chemicals, electrolytic and emulsion cleaners, one stage strippers, etc.

Your difficult surface cleaning problem may be a "pushover" for the experts

Klem Field Engineers are specialists in the cleaning and preparation of parts surfaces, qualified to solve most problems on the spot — backed by lab facilities that duplicate your plant conditions and where a quick answer may be had on the particularly tough jobs.

You'll like working with Klem. They'll get results for you and make your work easier.

There's a KLEM engineer near you

KLEM CHEMICALS, Inc.

14401 LANSON AVE., DEARBORN, MICHIGAN

LORCO COMPOUNDS FOR PRECISION BARREL FINISHING. Lord Chemical Corporation, 2066 S. Queen St., York, Pa., manufacturer of chemical compounds for precision barrel finishing, has issued a 32-page handbook and catalog on "Lorco" compounds for descaling, deburring, abrasive cut-down, non-abrasive cut-down, finishing, coloring, burnishing, metal cleaning and rust inhibiting. Lord Chemical Corporation is also a manufacturer and distributor of tumbling barrels, tumbling media, auxiliary equipment, and supplies.

Twenty standard "Lorco" compounds, and three special purpose compounds, are described in detail as to industrial purposes, characteristics, uses, and special advantages. A "rapid application index" serves to give the reader a quick reference to the particular standard and special purpose compounds recommended for various applications. A series of 24 unretouched "before and after" photographs show the results accomplished by "Lorco" compounds in cutting down, coloring, burnishing, descaling, and finishing machine and equipment parts.

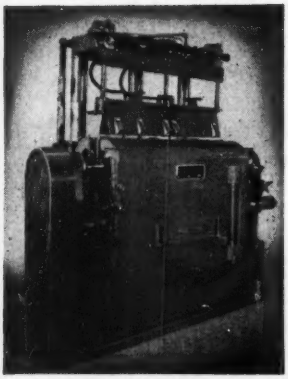
IRIDITE NO. 15 DATA SHEET. A folder answering the questions: What is Iridite No. 15? What Does Iridite No. 15 Look Like? Who Can Use Iridite No. 15? How is Iridite No. 15 Applied? is available from **Allied Research Products, Inc.,** 4004-06 E. Monument St., Baltimore 5, Md. Included are photos of sample panels treated with Iridite No. 15 and an MIL-3171 Type III magnesium finish.

ELECTROSTATIC SPRAY LITERATURE. Ransburg Electro-Coating Corp., 1234 Barth Ave., Indianapolis 7, Ind., has announced a new 16-page brochure on the **NO. 2 ELECTRO-SPRAY PROCESS.**

Available upon request from those concerned with production line painting, this booklet describes how the process works and proves paint and labor savings by case-history presentation of 27 production painting jobs on a wide variety of sizes and shapes of parts and products. In addition, Ransburg's laboratory facilities are pictured, and complete information on test procedure is given.

CENTRAL POLISHING MACHINE

Double Roll, Vertical Type — 18" Stroke



Central Vertical Polishing Machine with 18" stroke. Also available with 36" stroke and Horizontal Machines with 7 to 21 foot stroke.

. . . for high production

. . . for fine finishes

For polishing a wide variety of shapes, contours and flats. Fast, economical, simple to operate. Hydraulically operated and controlled. Women operate them.

Our Patented Hydraulic Contour Device gives a high finish to many difficult shapes. Stroke is adjustable by stepless increments from 2 inches to full stroke. Work may be oscillated across face of rolls, at the turn of a valve, for high finish and even roll wear.

Machines are used on cutlery, spatulas, putty knives, hand mirrors, auto trim, flat irons, hardware, machetes, wrenches, chisels and many other parts.

Central Polishing Machines may be set in batteries with conveyor feed system when a sequence of polishing operations is required. Conveyor and magnetic chucks can be furnished.

Full information on request.

CENTRAL MACHINE WORKS

72 COMMERCIAL ST., WORCESTER, MASS., U.S.A.

Exquisite

To be exquisite, said the philosopher, an object must be of outstanding quality as well as surpassing beauty. And where both quality and beauty are concerned, profit-minded manufacturers depend on a *fine finish* to enhance the product and insure its lasting attraction. To achieve these ends, many products demand a custom-coating that's tailored to individual requirements. The development of just such finishes is a specialty with Rockford Varnish Company, where laboratory technicians constantly solve coating problems for products of every kind. You can test the value of this service for yourself, by submitting a sample product for recommendation . . . . . .

Research, Quality, Service

ROCKFORD VARNISH *Company*
ROCKFORD ILLINOIS

Manufacturers of Protective and Decorative Coatings

Affiliate
GORDON BARTELS CO.
Roller Coating Specialists

BROCHURE FB-505. KEM FAST-BAKE ENAMEL is described in a four-page folder available from **Sherwin-Williams Co.**, General Industrial Div., Cleveland 1, Ohio. Features and film characteristics are listed. Also included are application suggestions and precautions regarding intermixing.

CLEANING TANKS AND METAL PARTS WASHER. BULLETIN CT-1, describing Heet-Master Cleaning Tanks and Metal Parts Washers, is being distributed by **Aeroil Products Company, Inc.**, 69 Wesley St., South Hackensack, New Jersey.

The bulletin describes typical uses for the covered, insulated cleaning tanks which are gas heated in such a manner as to produce a rolling action in the cleaning solution. Also illustrated and described are electrically heated portable small parts cleaning tanks.

SELENIUM RECTIFIER POWER SUPPLIES. A data sheet available from **General Electric Co.**, Schenectady, N. Y., outlines the features of the Type 6RS945P General Purpose D-C Power Supply for small plating tanks. An illustration of the rectifier, side view, cover removed, names and describes each of the component parts. A rating chart is included, as well as dimension outlines.

PAINT MIXER

MIRACLE
5 GALLON
PAINT REJUVENATOR
All paint restored to original consistency without opening the can.
2 minutes per gallon.
MIRACLE PAINT REJUVENATOR CO.
127 E. 9th St., St. Paul 1, Minn.

VIRGO DESCALING SALT. BULLETIN 25 which describes descaling of alloy steels as well as titanium and its alloys by means of the Hooker Process is available from **Hooker Electrochemical Co.**, Niagara Falls, N. Y. The Hooker Process is recommended specifically for the following alloys: nickel-chrome stainless steels, straight chrome stainless steels, stainless clad steels, nickel steels, resistence alloy steels, heat resisting alloy steels, Monel, Inconel, tool steels, Stellite, Hastelloys, silicon steels, carbon steels, N.E. Steels, S.A.E. Steels, wrought iron, titanium, titanium alloys. The forms in which metals and alloys are treated include: rod, wire, bars, tubes, sheets, strip, plates, clad sheets, clad strip, castings, forgings, fabricated parts, drawn parts, extruded parts.

The Hooker Process consists of immersing the products to be descaled in a Virgo Salt bath after which the load is lifted from the bath and quenched in water. Then follows a short dip in dilute muriatic or sulfuric acid (1 to 5 minutes) after which the material may be sprayed with water to remove the acid and reveal a clean and bright surface. A variation in the process for stainless steels involves a short dip in dilute nitric acid following the muriatic or sulfuric acid dip.

Full details concerning the process as well as illustrations showing actual plant installations are included in Bulletin 25.

ULTRASONIC-CLEANING FOR INDUSTRY. How the ultrasonic generator works, the principles of high-frequency sound cleaning, and examples of present applications are explained in a bulletin available from the **General Electric Co.**, Schenectady 5, New York.

Designated as **GEA-6056**, the two-color, four-page publication explains how the ultrasonic action of the generator hastens cleaning by as much as 100 times. Photographs and drawings show components of the equipment and the generator in use.

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ROBERTS ROUGE COMPANY
STRATFORD, CONN.
Originators of Micro-Lustre Finishers

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Fine buffing compounds are a combination of the best of materials and years of manufacturing experience.
Since 1881
A LONG TIME TO CONTINUE SUCCESSFULLY

Illustration shows cab doors for Autocar trucks being cleaned, phosphate coated, and dried.

This METALWASH phosphate coating machine provides an ideal surface for a lasting paint finish on truck chassis and sheet metal parts.

Cleaning and phosphating are uniform since the cycle is automatically controlled. Continuous operation, built around the conveyor line, eliminates material handling problems.

Write for illustrated catalog

Metalwash skill and experience is your assurance of lasting performance

METALWASH MACHINERY CORPORATION
915 North Avenue, Elizabeth 4, N. J.
Representatives in principal cities

FINER FILTRATION FOR BETTER PRODUCTS. Three models of filters manufactured by **Ertel Engineering Corp.**, Kingston, N. Y., are illustrated and described in a catalog sheet available from the firm. Model EU, an all-purpose filter; Model EW, for smaller production; and Model ECD, a cylinder-type unit; are the models covered by the sheet. Ertel Asbestos Filter Sheets are also discussed.

BOLTARON 6200 P.V.C. A four-page folder illustrating and describing the use of Boltaron 6200, a non-plasticized polyvinyl chloride, is available from **H. N. Hartwell & Son, Inc.**, Park Square Bldg., Boston, Mass. Mechanical, electrical and thermal properties are listed and also specifications of material available. A data sheet on Boltaron 6200 Pipe and Fittings is also available, which includes a dimensional chart and directions for installation of Boltaron pipe and fittings.

A four-page 8½ by 11 folder entitled **"RECOMMENDATIONS FOR THE PROPER PREPARATION OF MATERIALS PRIOR TO HOT DIP GALVANIZING,"** has been published by the **American Hot Dip Galvanizers Association, Inc.**, 1507F First National Bank Bldg., Pittsburgh, Pa. The folder illustrates and discusses the proper design and fabrication of a wide variety of products prior to hot dip galvanizing.

REVISED LACQUER EMULSIONS. New Developments in emulsifying agents and in emulsifying and formulating techniques are described in the revised edition of "Lacquer Emulsions," technical booklet available from **Hercules Powder Co., Wilmington, Delaware.**

The two main sections of the booklet are devoted to discussions of emulsion composition and emulsion preparation.

The section on emulsion composition includes material on film-formers, resins and plasticizers, solvents and diluents, emulsifiers, coloration, emulsifying equipment, emulsifying technique, and emulsion stability.

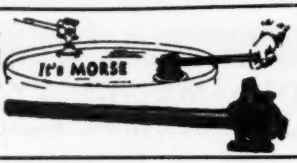
The second section includes material on the preparation of lacquer emulsions based on nitrocellulose, ethyl cellulose, and Parlon (chlorinated rubber).

BIBLIOGRAPHY ON SEQUESTRENE. Available from **Alrose Chemical Co.**, Box 1294, Providence 1, R. I., is a bibliography covering the 1952 literature on Sequestrene (ethylenediame tetraacetic acid). Also included in the bibliography are references to a number of earlier research papers on the subject. The many references point out the wide usefulness of this chemical and its various applications in science and technology.

CHEMICAL RESISTANCE OF VARIOUS TYPES OF RUBBER. A sales message originally released by **Republic Rubber Division, Lee Rubber & Tire Corp.**, Youngstown 1, Ohio, to its salesmen, has been made available to other interested individuals. Buna N, Buna S, Natural, Neoprene, and Butyl rubbers have been rated with one of four possible grades indicating the resistance of each to numerous commercial organic chemicals, organic chemicals, acids, and salts.

METALLIZING. An illustrated folder on the application of, uses for and benefits to be obtained from metallizing has been published by the **Protective Coatings Division of Metalweld, Inc.**, Scotts Lane & Abbottsford Ave., Philadelphia, Pa. Included is a section entitled "What The Metallizing Process Can Do For You" which contains photos, drawings and descriptive copy on the many applications for metallizing throughout industry. Uses for the various types of metals applied in metallizing are given as well as information on Metalweld's modern shop and field facilities.

Send NOW for this FIT-ALL
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!
SATISFACTION GUARANTEED.... **$3.30**
Non-sparking type $5.10
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When you can SEE the difference . . . IT'S TOO LATE!

Prime with STANTITE!

One switch box was primed with Stantite, the improved wash primer, before top coating; the other was not. Exposure discovered the difference and proved Stantite's strong resistance to corrosion and rust creep. And after years of research in Stanley laboratories there are other differences you can see right off . . . Stantite handles easier; it's easier to mix and easier to spray. Add these advantages to its excellent adhesion to all surfaces and its adaptability to most top coats. The result: a wash primer that insures your finish. For full details about spraying Stantite and clear Stantite for dipping write Stanley Chemical Co., 31 Berlin Street, East Berlin, Connecticut.

STANLEY

Industrial Coatings

STANLEY CHEMICAL

LACQUERS SYNTHETICS JAPANS ENAMELS

REYNOLDS ALUMINUM FABRICATING SERVICE. More manufacturers are upping their production by increasing their purchases of fabricated parts and sub-assemblies, according to a new booklet, **"CATALOG OF FACILITIES,"** just published by **Reynolds Fabricating Service,** 2001 So. Ninth Street, Louisville 1, Kentucky. This 24-page, 8½ x 11-inch booklet explains that this leaves the manufacturer free to concentrate his own production facilities on assembly and finishing operations.

Typical parts being produced by Reynolds Fabricating Service and shown in the booklet include television antennae from roll-formed tubing; deep-drawn washing machine tubs; evaporators, shelves, trays, and other items for refrigerators; door frames, wheels, and trailer bodies for the automotive industry; deep-well cookers for ranges; as well as a wide variety of other formed and finished parts.

An example of the unusual items available from these facilities is the complete hull for a 12-foot boat stamped out at one stroke of a press from a single sheet of aluminum 0.064-inch thick, 90 inches wide, and 158 inches long. This makes a finished boat hull measuring 22 inches deep, 55 inches wide, and 12 feet long, with three relatively deep ribs in the bottom for keel and two keelsons . . . possibly the largest aluminum stamping ever produced in quantity.

As its name implies, this "Catalog of Facilities" lists in considerable detail the equipment available for blanking, forming, welding, brazing, assembling, and finishing operations.

For finishing operations, facilities available include fourteen buffing lathes, six automatic buffing machines, three tank type etching and cleaning systems, a conveyorized Alodine system capable of handling sheets up to 4 x 12 feet, a 150,000-ampere capacity automatic anodizing system, two tank anodizing systems of 5000-ampere capacity each, and two conveyorized spray paint systems with electric drying ovens.

PAINT PANEL DRYING RACK BULLETIN. An illustrated leaflet designated as **BULLETIN NO. 130** describing steel racks for drying paint panels is available from **Gardner Laboratory, Inc.,** Bethesda, 14, Maryland.

The leaflet lists the available sizes and describes the construction of the steel racks which can serve as useful additions to paint laboratories in a paint manufacturer's plant or in a production painting department.

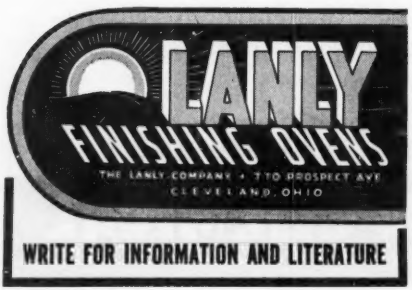
TORIT CATALOG. The complete line of Torit Dust Collectors is described in detail in a 16-page catalog issued by the **Torit Manufacturing Company,** 314 Walnut St., St. Paul 2, Minnesota.

Described in this catalog are both cabinet and cyclone type dust collectors. There are 14 standard cabinet models, ranging from ⅓ hp to 5 hp, and 10 in the cyclone types, also ranging up to 5 hp in size. Also shown is a line of blowers and exhausters, as well as accessory equipment for all units.

Numerous illustrations show the adaptability of Torit Dust Collectors to meet specific industrial dust collecting problems. A new section gives information on selecting dust collectors for different types of work. There is also a series of sketches and specification charts giving over-all dimensions, to show how Torit Dust Collectors can be fitted into a present or future production setup.

"WET PROCESS" TUMBLING BARRELS. BULLETIN NO. XL-52, offered by **Tumb-L-Matic, Inc.,** 4510 Bullard Ave., New York 70, N. Y., pictures and describes the Tumb-L-Matic "Wet Process" tumbling barrels—Type XL. These barrels are used for deburring, cutting down, smoothing and burnishing forged, stamped or cast metal parts by tumbling the parts in water with abrasive materials.

The bulletin describes drive mechanisms, electric controls and details of barrel construction. It includes specifications on six standard units now available.



SETHCO FILTER PUMP UNITS. An illustrated folder outlining the details of construction and operation of Sethco Filter Pump Models ASI-300, ASI-400, ASI-600, is available from **Sethco Manufacturing Co.**, 70-78 Willoughby St., Brooklyn 1, New York. The folder describes the construction of all elements of the pump units, including the Sethrin Filter Assemblies and the filter tubes available in cotton, Dynel, porous stone, and porous carbon. Advantages to be obtained by using the filter pump units are outlined in the folder.

THE MODERN WAY TO CHROMIUM PLATE. A brochure outlining the service-proved features of Self Regulating High Speed Solutions is available from **United Chromium, Inc.**, 100 East 42nd Street, New York 17, New York. The features listed are: higher cathode efficiency, self - regulation - automatic control, wider bright plate range, 20 to 80 per cent faster plating, greater leveling power, and minimum loss of fatigue strength. The leaflet is attractively illustrated with actual photographs illustrating advantages of the Unichrome SRHS Solutions.

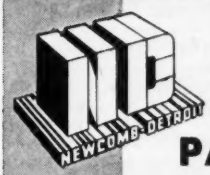
DIVERSEY ALUMINUX. BULLETIN NO. 51 A, describes, and lists seven advantages of using Diversey Aluminux, an alkaline etching compound for aluminum alloys. Available from **The Diversey Corp.**, Metal Industries Dept., 1820 Roscoe St., Chicago 13, Ill., the folder presents three illustrated case histories indicating the satisfaction of present users of Aluminux.

PLATING WASTE TREATMENT. Information on the treatment of electroplating rinse waters in industrial plants through the use of ion exchangers is contained in **BULLETIN NO. 3865,** an eight-page preprint of a paper, "Plating Waste Treatment," delivered by C. F. Paulson, special applications engineer, **The Permutit Co.**, 330 W. 42nd St., New York 36, N. Y., before the Eighth Purdue Industrial Waste Conference at Purdue University, Lafayette, Indiana.

Table, charts, cost and space comparison requirements and other data supplement the material which describes some of the forms in which industrially important metals can be economically recovered.

NEWCOMB-DETROIT

PIONEERS IN ENGINEERING, MANUFACTURE AND INSTALLATION OF



INDUSTRIAL OVENS
SPRAY BOOTHS
PARTS WASHERS
DUST COLLECTORS
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For Bulletins and Quotations, Wire, Write or Call—
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ELECTRIC RADIANT IMMERSION HEATERS, Bulletin TL-52. Glo-Quartz Electric Heater Co., Inc., 37934 Elm St., Willoughby, Ohio, has produced a four-page folder describing the construction and listing the uses and applications of the Glo-Quartz electric radiant immersion heater. The outstanding features of the heaters and special design features are quoted.

CORROSION RESISTANT CEMENTS. How do you know which kind of corrosion resistant cement to use to handle the particular chemicals you use in your processes?

To provide a ready answer to this complex question, the Corrosion Engineering Department of the **Pennsylvania Salt Manufacturing Co.** has prepared a comprehensive chart showing the resistance of seven classes of corrosion resistant cements to 297 of the most generally used corrosive chemicals.

The chart indicates that Pennsalt has a cement mortar which is resistant to the chemical attack of every one of these chemicals except sodium hypochlorite which, being an oxidizing agent on the alkaline side, will attack most materials at certain temperatures.

The type of cement mortars listed in the chart are: Silicate—Penchlor; resin type—Pennsalt Furan, Pennsalt Asplit, Pennsalt HF and Pennsalt PRF; and Sulfur—Pennsalt Sulfur and Pennsalt Carbon Sulfur.

Pennsalt corrosion engineers pointed out that the new chart is intended only as a ready guide in selecting chemical resistant cements to meet their particular problems. Because of the variety of conditions and constructions under which the chemicals listed are used, final selection should be based on an analysis of the problem by corrosion engineers of the cement manufacturer.

Copies of the new chart may be obtained by writing to the Corrosion Engineering Department, Pennsalt Chemicals, 1000 Widener Building, Philadelphia 7, Pa.

BURDETT INDUSTRIAL OVENS. A four-page, eye-catching catalog of Burdett Industrial Ovens featuring Burdett Gas Fired "Radiant Heat" Combustion System is available from **Burdett Manufacturing Co.,** 3447 W. Madison St., Chicago 24, Ill. Illustrated with application photos, the captions state the advantages of Burdett Ovens for paint drying, batch ovens, burn-off, core drying, and varnish cooking.

METABLAST BOOKLET. The complete story on the Metablast process for controlled surface finishing is available in a four-page, two-color bulletin issued by the **American Metaseal Manufacturing Corp.,** West New York, New Jersey.

Photographs show how a pre-determined, consistent finish can be applied to metal parts through the use of a special abrasive suspension applied to parts by means of air pressure. "Before and After" views of various parts are shown, and a detailed description of the operation of the Metablast machine included.

Special sections explain the variety of problems Metablasting can solve. A table of specifications accompanies a list of special features and accessories for "custom-tailored" Metablast units.

MASKING TAPE

DIE-CUT TO YOUR EXACT SPECIFICATIONS FROM

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INDIVIDUAL PIECES • ANY SIZE OR SHAPE

For quick, accurate masking operations.

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For a real good polishing job use

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FRESH SUPPLY AVAILABLE

KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

PENFIELD MODEL M-100 CATALOG SHEET. Available from **Penfield Manufacturing Co., Inc., 19 High School Ave., Meriden, Conn.**, is a two color catalog sheet illustrating and describing Model M-100 Mono-Column Demineralizer.

A photograph and schematic diagram of the equipment, together with a detailed description of parts, sample specifications and performance data, provide a concise report on the unit. The compact unit is stated to require only 2 ft. by 2 ft. by 7 ft., 6 inches of floor space.

Performance data includes information on chemical cost of producing pure water with the Model M-100 at various row water solids contents, and the gallons of treated water which can be produced per cycle in eacn case.

MULTI-DRUM FINISHING BARREL BULLETINS. The multi-drum finishing barrel units designed to barrel finish a maximum of eight different parts simutaneously are illustrated and described in two bulletins available from **Preakness Incorporated, 972 Broad St., Newark 2, New Jersey.** Four models, 4D, 8D, LD4, and Model 3, are covered by the bulletins. Exclusive features of the barrel finishing machines are described and advantages to the user are listed.

BECCO BULLETIN NO. 39. SURFACE TREATMENT OF METALS WITH PEROXYGEN COMPOUNDS is the title of a ten-page mimeographed booklet available from **Buffalo Electro-Chemical Co., Inc., Station B, Buffalo 7, New York.**

Various examples of the use of peroxygen compounds in treating metal surfaces are cited. The booklet roughly groups into four types the treatment of metal surfaces with oxidizing agents. One type of treatment aims at producing an oxide film on the metal surface proper. A second type serves to remove undesirable components of the metal surface, which may be surface impurities generally or more specifically components of the metal surface itself. Somewhat overlapping with this is a third type of treatment applied to dissolve and thus remove metal from a metal surface. Oxidizing agents are also used in a somewhat different type of treatment, where they serve to keep constituents of certain treating solutions in the proper state of oxidation.

use

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ELECTRO-POLISHING CONCENTRATES

SAVE TIME . . . SAVE LABOR . . . INCREASE PRODUCTION
SMOOTHS . . . BRIGHTENS . . . DEBURRS

Removal of metal can be controlled down to .0002 of an inch.

COPPER ALLOYS	ELECTRO-GLO #200
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THE KANIGEN PLATING PROCESS. A folder describing the Kanigen plating process, as applied to a wide variety of industrial products, is available from the **Kanigen Division, General American Transportation Corp.,** 135 South LaSalle St., Chicago 90, Ill. Illustrated in the folder are 23 different products which have been nickel plated by the Kanigen chemical plating method for abrasion or corrosion resistance, or both. The folder outlines the characteristics of the process, stressing its economic advantages.

PAMPHLET ON CLAD METAL. A pamphlet describing nine new developments has been announced by **Knapp Mills Inc.** of New York, America's largest producer of Ferrolum, lead clad steel, and Cupralum, lead clad copper.

Only a year and a half ago there was no satisfactory way to mass produce lead clad steel and lead clad copper. Today Knapp Mills possesses several patented processes which are producing millions of pounds of clad metals.

The new pamphlet gives detailed information on the following:

THE CUPRALUM ANODE, made of high conductivity copper to which a chemically bonded, corrosion resistant lead cladding has been applied. This new anode makes possible the hard chrome plating of large and irregular objects which were formerly considered impractical.

THE FERROLUM ANODE, made of carbon steel to which a chemically bonded, corrosion resistant lead cladding has been applied, offers three times the conductivity of ordinary lead anodes.

FERROLUM LEAD CLAD STEEL IMMERSION HEATER, designed for use with certain corrosive liquors such as sulfuric, chromic, phosphoric acids, sulfate solutions, is direct fired.

THE KNAPP LEAD-PLATE HEATER, recommended for use with 10 pounds of steam or less. This new lead plate heater is strong, compact, relatively light in weight and provides the largest practical square footage of heating area in the smallest space.

THE UNIVERSAL PIPE SUPPORTER, an ingenious lead clad steel supporter which is adaptable to any pipe or coil installation and offers superior strength, acid resistance, versatility and ease of handling.

THE AUTOMATIC LEAD CLADDING MACHINE. Knapp Mills Inc. has developed two types of automatic lead cladding machines. Both will clad and chemically bond lead to prepared steel. The first is a small unit weighing about 15 pounds which can operate either one or two cladding torches. It applies a strip of lead about three inches wide by $\frac{3}{16}$ of an inch thick at a speed of about one foot a minute. The larger unit carries from one to ten cladding torches and will lay down a strip of lead with a maximum width of 12 inches and a maximum thickness of $\frac{1}{4}$ inch in one pass. Knapp Mills Inc. will enter into licensing arrangements for the use of both of these machines under its patents.

KNAPP RAYSIST COMPOUNDS. As the name implies, these lead putties or cements can be used for the containment of harmful radiation. They are produced by special techniques so that they have a sufficiently high density to have good shielding value when caulked into place in cracks and joints. Some of the compounds remain plastic after caulking while others will harden into place.

LEAD-LUBE, is a lead lubricant containing a high percentage of metallic lead powder held permanently in suspension in a grease vehicle. It was developed

CORROSION-PROOF LININGS CEMENTS BRICK

• TANKS, FLOORS, FUME DUCTS AND PROCESS EQUIPMENT
• COMPLETE LINE OF PROTECTIVE COATINGS . .

Over a Quarter Century of Experience

CEILCOTE CORROSION-PROOF MATERIALS • CONSTRUCTION • SUPERVISION

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SOLVENTS and THINNERS RECOVERED

from wash thinners, spoiled lacquers, degreasing machine sludge, etc.

Solvents recovered by the Lofgren Process. Each customer's shipment, whether one drum or a carload, receives proper and separate treatment. *Write to:*

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241 Brunswick Rd. Hammond, Ind.

for heavy-duty use in the presence of corrosives and abrasives. Under pressure, the particles of lead powder are carried into the gear or bearing surfaces where they coalesce and form a uniform overlay of lead on all wearing surfaces.

THE GUIDLER. Because it serves as an idler as well as a guide, this new device helps protect conveyor belt edges from ripping and tearing even under the most heavy use. An application of the hyperbolic principle, this revolutionary new device is covered by world-wide patents and patent applications.

PARAPRIME DATA SHEET PR-253. Foundry Rubber, Inc., 6100 River Road, Washington 16, D. C., has available a sheet describing Paraprime, a red lead primer which contains special rubber chemicals to provide resistance to galvanic corrosion, acids, alkalis, chemicals, corrosive gases, and moisture.

The sheet describes the product, some of the components of the product, and methods of application. Outstanding characteristics are listed.

POLISHING MANUAL. A 12-page, illustrated brochure—**"THE 3M METHOD OF BELT GRINDING AND FINISHING"**—is now available upon request from **Minnesota Mining and Manufacturing Co.**, 900 Fauquier St., St. Paul 6, Minn.

The booklet describes the 3M method, using coated abrasive belts, as a high-speed means of grinding and finishing flat or contoured surfaces of all kinds of metal ranging from soft brass to super hard tungsten carbide, as well as glass, plastics, ceramics and hard rubber.

Covered in the booklet are the advantages offered by the 3M method—faster cut, cooler operation, greater economy, less operator fatigue, better finishes.

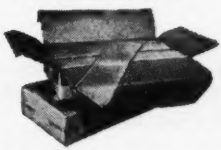
In addition, it illustrates by means of photographs and drawings eight abrasive belt machines for a wide range of typical grinding applications in operations ranging from those of the small shop to the large factory.

Also included in the brochure are typical case histories citing examples of significant savings in unit costs and greatly increased production where the 3M method has been adopted.

For Dust Free Finishes!

BOND TACK CLOTH

IN ROLLS
Cut off any size piece to use as needed.



IN BULK
Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available in Rolls or Cut Bulk—White or Gold In Three Different Types of Cloth

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up!

The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" for ease of handling. ALL BOND TACK CLOTH is *Spontaneous Combustion Proof, Lint-Free* and *Wax-Free*. Gives a sparkling speck-free Finish every time. Clean and sanitary. No waste.

TRY THEM and COMPARE RESULTS. Samples Gladly Sent Upon Request.

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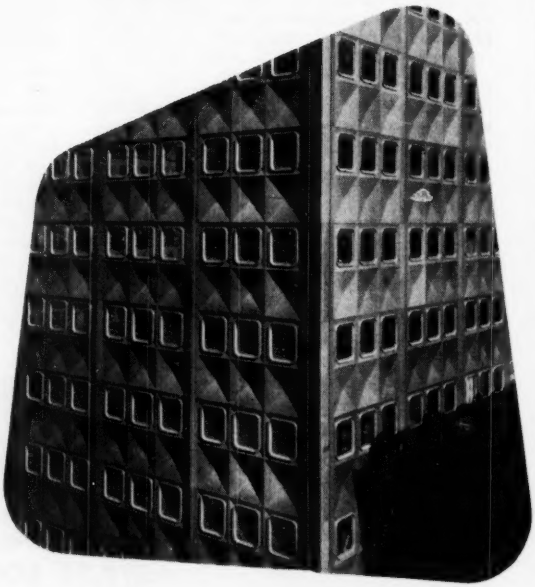
"The Tacky Wiper Specialists"
2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS

ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES —144 to the Carton

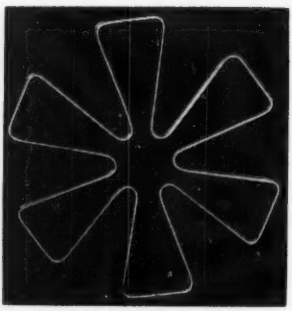
A WARRANTY OF SATISFACTION IN EVERY CARTON

Finishes



● Exterior walls of the new 410 foot Alcoa Building in Pittsburgh are faced with aluminum panels. The exterior panels were finished by anodizing in sulfuric acid to increase corrosion resistance and form a pleasing iridescent gray color on the surface.

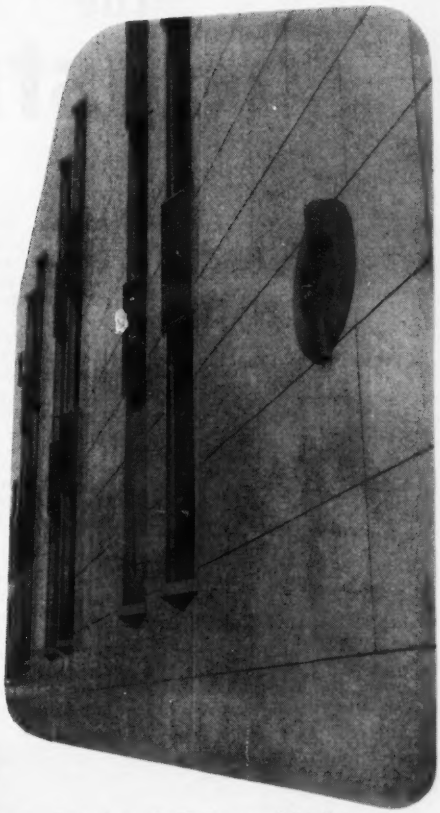
(Photo courtesy Aluminum Company of America, Pittsburgh 19, Pennsylvania.)



● Grill for sand urns or smoking stands is formed of 3/16 inch round Armco Type 430 cold drawn stainless wire and electropolished after fabrication.

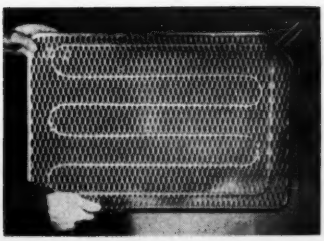
(Photo courtesy Armco Steel Corporation, Middletown, Ohio.)

that aid in appearance and utility



● Porcelain enamel steel panels used for the building exterior shown are finished in one enamel ground coat and two cover coats of acid resisting full matte porcelain enamel.

(Photo courtesy Texlite Inc., Dallas, Texas)



● Freezing shelf for upright home and commercial freezers is constructed by brazing tubing to expanded metal. The assembly is zinc plated and bright dipped in a chromate solution to form the bright corrosion resisting finish.

(Photo courtesy Tranter Mfg. Co., Lansing 4, Michigan.)

NEWS of the Industry

NEW PLANTS

INDUSTRIAL SYSTEMS COMPANY, formerly of New Brunswick, has moved to 32 Main Street, Matawan, New Jersey, in order to facilitate its function as exclusive distributors for **INDUSTRIAL WASHING MACHINE CORP.,** also of Matawan.

Industrial Systems Company is sales representative for the washing and metal treating machines manufactured by Industrial Washing Machine Corporation and also for I. S. C. Conveyor Systems.

These machines are adapted to all industries, including all types of metal treating and finishing.

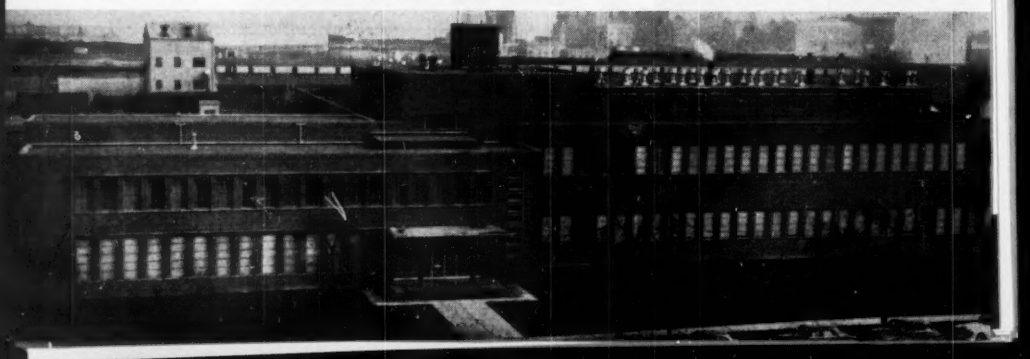
ACE ABRASIVE LABORATORIES has now combined its operations in its own modern building at 35 Roselle St., Mineola, N. Y. Formerly in two New York City locations, the executive offices are both expanded in the new quarters which contain about 10,000 square feet of floor space.

Ace is a pioneer manufacturer of laboratory graded diamond abrasives and according to Benjamin Greenfield, president, the move also provides the opportunity for improved research facilities as well as faster service to its customers.

WYANDOTTE CHEMICALS CORPORATION, Wyandotte, Michigan, recently completed and placed in full operation a new 74,800 square foot research laboratories building.

Contained in the new Wyandotte Laboratories building, which has been designated by impartial observers as the finest research facility in the industry, are: laboratories devoted to public sanitation including a complete microbiological section; facilities for studying metal finishing operations which include an exclusive

Fig. 1—Within the Wyandotte Laboratories are special areas assigned to research in such important fields as radioactive tracers, electronics, organic and inorganic chemistry, sanitation and germicides, electroplating, physics and the entire area of commercial cleaning served by such products as dishwashing compounds, laundry detergents, and metal and industrial cleaners.



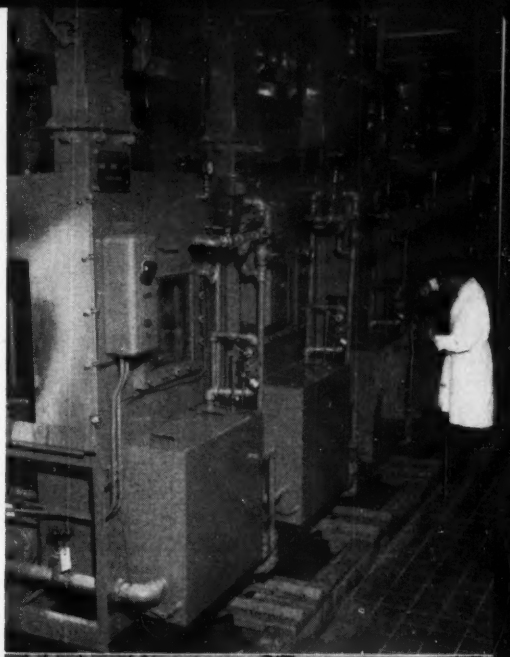


Fig. 2—Multi-stage Conveyorized Spray Washer, consisting of seven completely independent units, is the only one of its kind in this country. The units may be disconnected, pulled out, reassembled, and the line shortened or lengthened to duplicate precisely any kind of washing cycle desired. An overhead carrier passes metal parts through the washer from which they emerge passing a hot air blow-off unit which dries the parts. The machine was built by Metalwash Machinery Corp. Temperatures of the various solutions are controlled automatically by Powers temperature regulators.

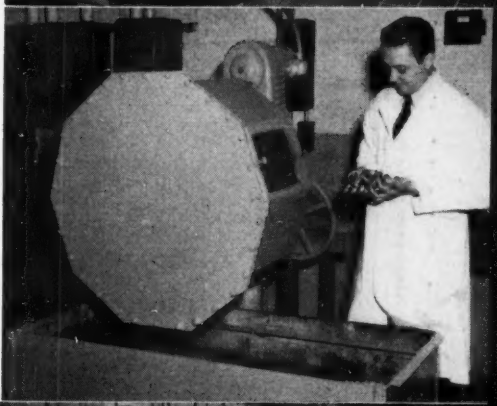


Fig. 3—Zinc base die castings are visually inspected by a member of the research staff after running them in a full size Globe tumbling barrel using one of Wyandotte's newer compositions. A complete stock of different sized and types of stones, chips, steel shapes and synthetic abrasives is carried in Wyandotte's new laboratories. This makes possible tests on new compositions and recommendations to Wyandotte customers which cover almost any conditions encountered industrially.

Fig. 4—A portion of the 18 cleaning, electrocleaning and electroplating tanks of Wyandotte Chemicals Industrial Research Department. Each electroplating tank has its individual rectifier (Rapid Electric or Udylite) and exhaust hood, and all tanks are thermostatically regulated. An overhead monorail aids in handling heavy parts to be cleaned or plated. Test pieces may be taken through any desired cleaning and plating cycle in order to evaluate experimental cleaners, plating solution additives, and other process or material factors.

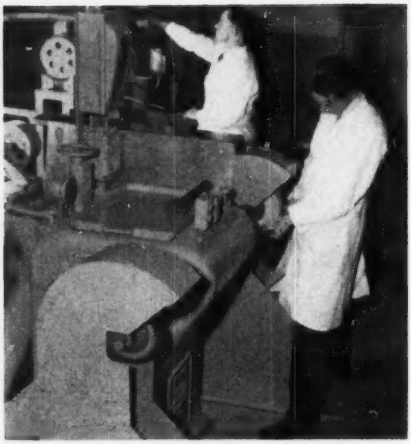


Fig. 5—Members of the Wyandotte research staff are shown operating the two units of the commercial size buffing and barrel finishing installation. The buffing and barrel finishing laboratory provides facilities to attain any desired degree of surface finish on metals and alloys.

plant-size, power spray washer capable of duplicating almost every commercial operating cycle in use in North American manufacturing plants; a complete commercial type, laundry washroom installation together with latest testing devices for use in studying textiles; a nucleonics laboratory where soils are tagged with radioactive tracers and the efficiency of various cleaning operations is measured with Geiger counters; a physics laboratory where over 23,000 chemicals have been "finger printed" on punched cards —this laboratory is the first to adapt high speed electronic equipment to the sorting of this chemical information; the entire building was designed as a permanent "maintenance cleaning project" including one hallway containing 14 different kinds of flooring; an electronics laboratory which develops many of the recording devices used in Wyandotte research and by Wyandotte customers in securing maximum cleaning efficiency; six separate constant humidity, constant temperature rooms which permit testing of packages and storage performances of experimental products; two wings of organic and analytical laboratories, a library containing over 7,000 volumes and regular issues of 175 technical magazines, patent department, an auditorium seating 150 persons, a unique arrangement for distributing utilities and special services, and a 375 ton air conditioning installation which makes it possible to heat or cool any area as desired.

AMERICAN CHEMICAL PAINT COMPANY'S Detroit office has moved to 10225 West McNichols Road, Detroit 21, Michigan. D. L. Miles, manager of the mid-west territory is supported by a staff of technical sales-service representatives consisting of J. B. Rohrer, J. J. Linden, O. E. Crisler and other field representatives.

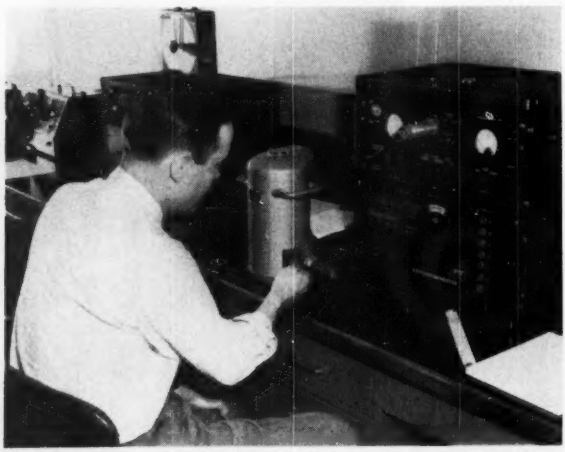


Fig. 6—Utilizing the radioactive materials only relatively recently made available from the atomic pile at Oak Ridge, Wyandotte physicists have made long strides in the development of improved methods of detergent evaluation. Here the physicist has just removed a metal specimen previously coated with radioactive soil from the counting chamber of the Geiger counter. This specimen will then be cleaned under standardized conditions and recounted to determine if residual soil remains. The method is far more delicate than any practical evaluation method yet devised.

New Detroit office of American Chemical Paint Company.

As in the past, warehouse stocks of ACP's complete line of rust-proofing chemicals, phosphate coating chemicals, and metal cleaners, rust removers, and pickling acid inhibitors are maintained.

Fig. 1—Entrance to new sales offices of **BELKE MFG. CO.** To meet growth requirements, offices of William E. Belke and the sales department have been moved to new quarters. Stairway beside the garden leads to engineering department.

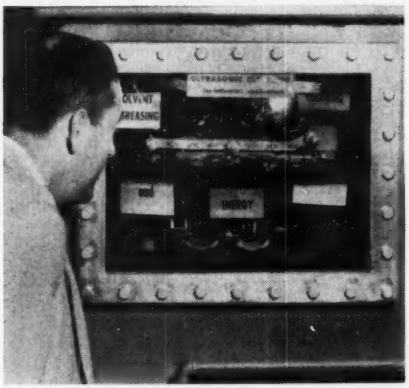
Fig. 2—New office of William E. Belke, founder and president of Belke Mfg. Co., Chicago, Illinois.

COWLES CHEMICAL COMPANY, Cleveland, Ohio, has announced that construction of a 20,000 sq. ft. addition to their plant at Skaneateles Falls, New York is now under way. When completed in mid-1954, the addition will make available increased warehouse space and provide for a new plant office and control laboratory, as well as expanded research facilities and pilot plant operations.

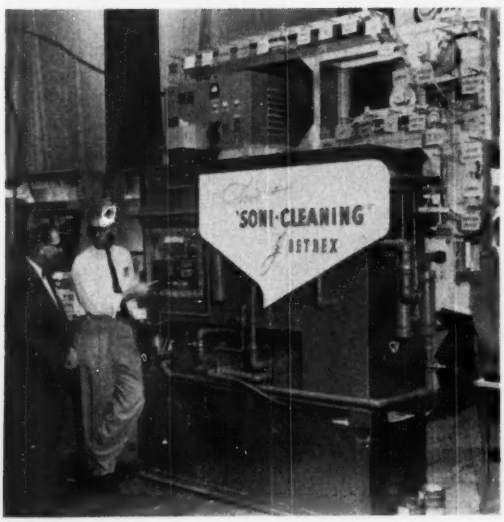
COMPANIES

Cratex abrasive engineers will, without charge, make a complete analysis of your burring, smoothing and polishing operations and offer recommendations regarding the correct use of "rubberized abrasives."

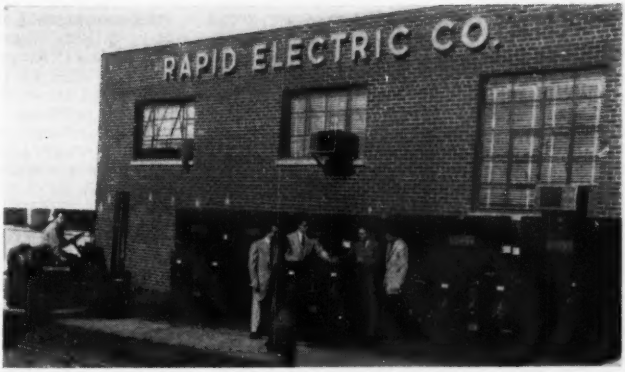
This service is based on 30 years' application experience in the correct use of rubberized abrasives on burring, smoothing, and polishing operations. Send for Cratex Application Analysis Form No. 205 to **CRATEX MANUFACTURING COMPANY**, 81 Natoma Street, San Francisco 5, California.



(Left) A visitor to the **DETREX CORPORATION'S** display at the National Metal Exposition watches the results of ultrasonic waves as they "scrub" metal plates passing through a solvent solution. A Soniclean machine, especially equipped with a heavy plate glass window, allows spectators to witness the effects of sound energy on greases, oils, and waste metal particles. Detrex reports that its Soniclean process can be applied to non-absorbent materials such as metals, glassware, and molded products in removing such difficult soils as buffing, lapping, and honing compounds, and iron oxide residues and fluxes to a degree previously not obtainable. In addition, the process can replace many hand brushing or wiping operations to remove soils from cavities, shallow indentations, small holes, and other precision finished surfaces. In the Detrex Soliclean process, electrical energy is converted to high frequency sound energy through the use of a Piezo-electric transducer.



First public demonstration of a fully conveyorized production model Soniclean machine, which applies ultrasonic energy to precision metal cleaning, was made by the **DETREX CORPORATION** of Detroit at the recent National Metal Exposition in Cleveland. The Soniclean machine, using a trough-type barium titanate transducer directly immersed in a degreasing solvent, generates particle acceleration to 1,500,000 times the force of gravity in the focal region, producing superlative cleaning results. Detrex, major manufacturer of industrial cleaning equipment and chemicals, is the first to take ultrasonic metal cleaning out of the laboratory and install conveyorized operating units in the field. In the photo, Dr. William L. McCracken (left), Detrex's director of research, discusses a technical point with Detrex ultrasonics specialist Donald Johnson.



Record shipment of rectifiers in front of Rapid Plant.

RAPID ELECTRIC COMPANY was true to its name recently by making delivery of 24,000 amperes/12 volts rectifying power capacity in just 9½ working days. An emergency order for six rectifiers, each 4000 amperes/12 volts, with three remote control cubicles, each handling 8000 amperes/12 volts was phoned into the Rapid main office on October 21, 1953. Final testing and inspection was completed at 3:30 p.m. November 4, 1953, or a total of 9½ days later. Normal delivery on a shipment of this size is usually quoted as being 6-8 weeks, yet Rapid made this record shipment without upsetting any delivery schedules on other work in progress.

The rectifiers were shipped to Worcester, Mass., for use in hard chrome plating operations.

Field service representatives of **OAKITE PRODUCTS, INC.**, manufacturer of specialized industrial cleaning and related materials, are shown as they gathered for the third of a series of regional technical-sales conferences at the Hotel Roosevelt, New York City, on December 7, 8 and 9. The men, from the company's Cleveland, Southern, New England, Philadelphia, and New York and Metropolitan divisions discussed new materials and methods to help industry keep costs down while solving ever more complicated production and maintenance cleaning problems. Similar meetings were held in San Francisco and Chicago for other divisions of the company's technical field service organization.

Reflecting the entirely new concept of the usefulness of platinum metals, **BAKER & CO., INC.**, Newark, N. J., world's largest refiner and worker of the precious metals, has established a new center for basic research. It is described in an illustrated brochure. "Research — Foundation for Production," which is now being circulated in the electronics, textile, chemical, pharmaceutical, petroleum and communications industries as well as in the fields of dentistry, research, jewelry and the decorative arts.

A member of the Engelhard Industries group, Baker & Co. operates its main plant in Newark and has subsidiaries in Canada, England and Switzerland. In addition to the six platinum metals — platinum, palladium, iridium, rhodium, osmium and ruthenium—the company is

Field service representatives of Oakite Products at recent regional technical-sales conference in New York City.

an important refiner and worker of gold and silver.

Each of the eight manufacturing divisions in the company's main plant has its own equipment and staff for investigation, testing and laboratory control in its special field. The new center for basic research supplements these divisional activities with broad investigations and intensive study of the precious metals and their alloys. The three main components of this center are departments for chemical and for physical research, and one of the most complete precious metals libraries serving industry.

Bias Sisal Buffs will now be available to the metal finishing industry in larger quantities than before, as a result of the formation of **THE JOE-D BUFF COMPANY,** Sandwich, Illinois.

The new company, holder of the original patent on the Bias Sisal Buff (U. S. Patent No. 2,642,706), combines the assets and interests of two former Chicago firms: Joseph R. Davies & Associates and Dearborn Industrial Manufacturing Company. The organization has a thoroughly-experienced staff, including some of the top "know-how" in the industry, and the large, modern plant in Sandwich, Illinois, is already in full production. With this additional capacity and personnel, output of Bias Sisal Buffs has been substantially increased.

The complete JOE-D Buff line includes not only Bias Sisal Buffs, but also Bias, Bias Spoke ("Finger"), and conventional buffs, as well as polishing wheels of all grades and constructions, for every metal finishing purpose.

Distribution of the JOE-D Buffs is primarily through jobbers, and several good territories are stil available.

Immediate service is today as important as quality of product, believes Clyde H. Reeme, president of the **UDYLITE CORPORATION.**

Standards among products are becoming more and more identical, so a successful business must compete with other firms by providing better service to customers, he said.

Mr. Reeme pointed out that although his firm has six factories in Detroit, it has just opened a new warehouse dedicated to speed in filling local orders. The warehouse, at 5203 Martin Avenue, has 65,000 square feet of floor space amply stocked with plating and finishing supplies.

Items on hand for shipment include acids, anodes, rubber goods, test sets and a complete line of chemicals for plating. Thirty employees and a fleet of trucks are prepared for prompt handling of orders.

Udylite has other warehouses in Atlanta, Cleveland, Chicago, Grand Rapids, Indianapolis, New York, Philadelphia and Rockford, Ill. Affiliate organizations are located in eight other cities throughout the country.

A process for making the surface of aluminum file-hard and more resistant to wear than chromium plating or hardened steel has been installed by the Metal Finishing Division of the **PYRENE MANUFACTURING COMPANY,** 10 Empire Street, Newark, New Jersey, according to Luis E. Eckelmann, vice president. This process, known as Alcoa hardcoat or Martin Hardcoat, is being extensively used in the aircraft industry where the combination of light weight and a wear-resistant surface is required. The Pyrene plant is already handling a sizeable volume of contract work for manufacturers in the greater metropolitan area.

Hardcoat also can be used in conjunction with the electrofilm process which is a permanent solid film dry lubricant impregnated into the surface. It provides a low coefficient of friction throughout wide ranges of temperatures and exposures. Other Pyrene processes for the fin-

ishing of aluminum include "Alumilite" precision anodizing of the chromic and sulfuric acid types.

THE PORCELAIN ENAMEL INSTITUTE, 1346 Connecticut Avenue, N. W., Washington 6, D. C., has announced that a new product label has been approved and released for general use on products having a genuine porcelain enamel finish. The label is in two forms; one a yellow and blue label denoting acid-resisting porcelain enamel finish, the other a green and blue label denoting regular porcelain enamel.

Available to all manufacturers of porcelain enamel products, the label is designed to identify a genuine porcelain enamel finish, as differentiated from

Genuine
PORCELAIN ENAMEL
THE LIFETIME FINISH
THIS MATERIAL IS
ACID RESISTING
PORCELAIN ENAMEL
• Will not rust, burn, or discolor
• Does not harbor odors or germs
• As easy to clean as a china dish
• Is not harmed by household acids, fruit juices or alcohol
• Hardest household work surface
• Color and beauty will not fade
GUARANTEED by the manufacturer to conform with the "General Specification for Porcelain Enamel Surfaces-Acid Resistant Type (PEI S-102)" of the Porcelain Enamel Institute, Washington, D. C.
TO CLEAN: USE DAMP CLOTH, SOAP AND WATER
Printed in U.S.A. ©

other types of product finishes. The label is expected to prove a potent point-of-sale tool since it clearly states to consumers the many advantages of a porcelain enamel finish.

NEW POSITIONS

JOSEPH J. SCHAEFER and **FRANCIS B. BRYANT** have been appointed sales engineers in Udylite Corporation's Chicago regional sales office.

J. J. Schaefer (left), Francis B. Bryant

Mr. Schaefer, formerly with Parke, Davis & Company, Detroit, is assigned to Chicago's northside sales district. A member of the American Chemical Society, he was graduated from the University of Detroit with a Master of Science degree in Chemistry.

Mr. Bryant's new headquarters are at Bettendorf, Iowa. The district includes western and southern Illinois, Iowa and Nebraska.

He is a graduate of Albion College, Albion, Michigan, and was associated with the Provident Mutual Life Insurance Company before joining The Udylite Corporation.

WILLIAM W. GRAM and **AARON BARKMAN** have been named to new posts in the paint manufacturing department of The Sherwin-Williams Co. Announcement of their appointments was made recently by Victor Mills, general manager of paint, varnish and lacquer manufacturing for the company.

Mr. Gram, who joined Sherwin-Williams in 1936, has been appointed general superintendent of the Newark paint and varnish plant. Employed originally at the Cleveland factory, Mr. Gram was later transferred to Newark as assistant to the general superintendent. Later, he returned to Cleveland as superintendent of production for all of the company's paint, varnish and lacquer factories. Following this, Gram moved to Chicago as superintendent of paint production, from which he moved to his present assignment.

Succeeding Mr. Gram at Chicago is Aaron Barkman, another Sherwin-Williams veteran. He has been with the company since 1935, when he was employed as a chemical engineer.

Ralph L. Eastman (left), Frank Watt, Guy Cummings

Mr. Barkman organized and directed both the industrial engineering department at Chicago and the dispersion laboratory. In his new post he will continue in charge of the dispersion laboratory along with operating the largest paint production unit in the world.

Promotions of six staff personnel at Frederic B. Stevens, Inc., have been announced by W. J. Cluff, president of the plating and foundry supply firm.

FRANK WATT, new general sales manager for the metal finishing and foundry divisions, formerly was sales manager for the metal finishing division. He joined Stevens in 1934 as a sales engineer.

GUY CUMMINGS, an electrical and sales engineer, takes over Watt's former post. **CLAIR CRAWFORD,** a service engineer, has been named sales manager for the foundry division.

RALPH L. EASTMAN, new consultant on all metal finishing operations, formerly was manager of the buffing composition department. **DURWOOD J. SWANINGER,** formerly assistant manager of the buffing department, has been named sales manager of buffing compositions.

CORRECTION

On page 94 of the December, 1953, issue of PRODUCTS FINISHING, in the advertisement for John Wiley & Sons, Inc., reference was made to the book "Modern Electroplating" as "the new 2nd Edition." This last phrase should have been omitted.

DR. J. A. RIDDERHOF, formerly manager of the foundry facing department, has been appointed manufacturing manager and director of research for the foundry facing and buffing composition departments. He has been with Stevens for 26 years.

Promotion of two veteran executives to vice-presidencies and formation of two new autonomous divisions in Diamond Alkali Company have been announced.

W. H. McCONNELL, director of sales, has been elected vice-president, sales. **C. E. LYON,** works manager of Diamond's electrochemical plant at Houston, Texas, also becomes a vice-president.

Also announced was the formation of two new autonomous divisions: the Plastics and Agricultural Chemicals Division with **A. L. GEISINGER,** a vice-president, as general manager of the division; and the Chromium Chemicals Division with **FRANK W. JARVIS** as general manager. Mr. Jarvis since 1951 has been president of Diamond Magnesium Co., a subsidiary of Diamond Alkali.

JOSEPH P. STANAVAGE has joined the Research and Development Division of the Pennsylvania Salt Manufacturing Company and will work on projects of the Corrosion Engineering Products Department.

A chemistry graduate of the University of Scranton, Mr. Stanavage spent one year as a graduate assistant at Wesleyan University. He comes to Pennsalt from the General Chemical Division of Allied Chemical & Dye Corporation.

The Industrial Filter & Pump Manufacturing Company, 5904 West Ogden Ave., Chicago 50, Ill., has announced the following district representatives in sales and service engineering for the line of pressure filters, demineralizers, heat exchangers, salt fog test cabinets, cen-

Gil Valentine (left), James Filkins, George J. Dawson

trifugal pumps, rubber lining service, and waste treatment systems.

GEORGE J. DAWSON will cover Pennsylvania and western New York from the new branch offices at 834 Lovitt Way, Pittsburgh 12, Pa., and 808 Land Title Building, 1400 Chestnut Street, Philadelphia, Pa. Before joining Industrial Filter & Pump Mfg. Co., he was a staff chemist with Infilco, Inc., and engineer and chemist for Commonwealth Edison Company, Chicago.

GIL VALENTINE is covering Michigan from the new Detroit branch office at 424 Book Building, Detroit, Mich. Mr. Valentine was previously sales and service engineer in the plating chemicals division of the McGean Chemical Co., sales engineer with Wagner Bros., Inc., and sales manager of technical processes with Promat Division of Poor & Co.

JAMES FILKINS will cover the states of Texas and Oklahoma from the new Dallas branch office at Dorchester House, Dallas, Texas. Previously, Mr. Filkins was analytical and development chemist for Pure Oil Company and manager of the petroleum section for Commercial Testing & Engineering Co.

DR. S. R. BENSON has been appointed director of dry color research, and **R. W. DAVIS** has been appointed superintendent of dry color production of The Sherwin-Williams Company, it has been announced by M. B. Doty, superintendent of the dry color department. Both of these men have been employed in the dry color department since February 1936, and thus have completed 17 years of service with the company.

Dr. Benson received his Ph.D. degree in Chemistry from the University of Wisconsin and has served The Sherwin-Williams Company in the capacity of research chemist and group research leader.

Mr. Davis received his B.S. degree in Chemical Engineering from Iowa State College, and he has held the positions of operator of the flushed color factory and operator of the dry color factory prior to his recent promotion.

Appointment of **DR. MATTHEW W. MILLER** as technical director of the coated abrasives and related products division has been announced by Minnesota Mining & Manufacturing Company.

For the past six months Dr. Miller had been business manager of 3M's central research department.

Dr. Miller received his doctorate from the University of Illinois in 1940. He spent four years as an Army officer before joining 3M as a research chemist in 1947. He is chairman of the Minnesota Section of the American Chemical Society.

Heil Process Equipment Corp., Cleveland, Ohio, manufacturer of chemical proof tanks, tank linings, impervious graphite heat exchange equipment, lead anodes, steam jet agitators and RIGIDON plastic exhaust hoods and duct work, has appointed **KEN W. GRADER** as Chicago district representative. Mr. Grader will make his headquarters at 400 W. Madison Ave., and will be able to offer immediate assistance to the many Heil customers in this area.

The appointment of **RICHARD F. PROTIVA**, as district sales engineer, has been announced by E. W. Vereeke, general sales manager of Heil Process Equipment Corporation.

Mr. Protiva will be responsible for all sales in the eastern portion of the home territory.

Oakite Products, Inc., manufacturer of industrial cleaning and related materials, have assigned three new technical service representatives to territories. **LINDEN C. WATKINS**, for several years foreman of the plating and hardening

Joseph M. Newey (left), Linden C. Watkins, R. W. Krajicek

division of the Remington Rand, Inc., plant in Elmira, New York, is now the Oakite representative in Nassau and Suffolk Counties, Long Island, New York.

R. W. KRAJICEK, formerly with the Phillips Petroleum Co., and a graduate in chemical engineering from Gonzaga University, is now representing Oakite in the state of Montana. **JOSEPH M. NEWEY,** a graduate of the University of Utah, has been assigned to serve metal accounts in the Salt Lake City area.

The new service representatives recently completed an intensive seven-week training course at Oakite's New York headquarters and in the field.

Lowell Harrison Miller

LOWELL HARRISON MILLER has been named a Pacific Region industrial representative in Los Angeles for The Glidden Company, it has been announced by Thomas N. Armel, National Industrial Sales Manager.

Mr. Miller's background in industrial finishes dates back to 1925, when he joined the Dodge Bros. Corporation as a paint chemist. Subsequently, he served as chemist and paint engineer for the Frigidaire Division of General Motors Corporation and chief chemist and paint engineer for the Norge Division of Borg-Warner Corporation.

Four years in the technical sales department of a leading paint manufacturer helped round out Mr. Miller's rich background. Before joining Glidden, he helped establish and served as manager of the Vedoc Paint Division of Ferro Enamel Corporation.

This wealth of information accumulated during his years of work on some of the largest paint production lines in the country should prove valuable to Los Angeles paint buyers.

Mr. Miller will reside in Los Angeles and make his headquarters at the Glidden offices there, 4255 North Produce Plaza.

Two field engineers have been appointed by Norton Company, Worcester, Massachusetts. **BURTON G. EBBESON** has been appointed to the Worcester area with headquarters at the main Norton plant. **CHARLES M. WELLONS** will be a field engineer working out of the Philadelphia district office.

Mr. Ebbeson has been with Norton since 1936, and has worked in Manufacturing Control, Research and Development, and Sales Engineering.

Mr. Wellons first entered Norton Company in 1950 as a sales trainee and after completion of the training course, was assigned to the Sales Engineering Department.

Promotion of **JOHN A. REESE** to sales manager for industrial and hardware paint trades in the St. Paul area has been announced by the coated abrasives division of Minnesota Mining & Manufacturing Co. Mr. Reese has been a salesman for 3M since 1947.

In addition to coated abrasives, 3M produces "SCOTCH" Brand cellophane, electrical, industrial, masking, filament, and sound recording tapes; adhesives and coatings; roofing granules; reflective sheeting; plastics; ribbons and laces; printing accessories; office duplicating equipment and chemicals.

The Cambridge Wire Cloth Company, Cambridge, Maryland, has announced the election of the following new officers: Clarence E. Pink, chairman of the board and chief executive officer; **EDWARD N. EVANS,** president; **IRWIN F. PINK,** senior vice president; **FRED L. HOOPER,** executive vice president; **HAROLD E. PINK,** Secretary; and **NINA E. PINK,** Treasurer.

Clarence E. Pink has been president of the company since 1937, when he succeeded his father, the late Edward F. Pink. From 1920 to 1937, Mr. Pink was secretary and treasurer, and general sales manager.

Edward N. Evans, formerly vice president and general manager, has been associated with the company for sixteen years, and during that period served variously as general sales manager, secretary and treasurer.

Irwin F. Pink was formerly the executive vice president, and has been associated with the company for thirty-one years. He is also the son of the late Edward F. Pink, one of the founders of the company.

Fred L. Hooper was formerly assistant to the president and has been associated with the company for twenty-six years.

Harold E. Pink has been with the company for twenty-one years and is a son of another founder, the late Robert W. Pink.

Nina E. Pink has been with the company for twenty-four years and is a daughter of the late Robert W. Pink.

The Cambridge Wire Cloth Company, producer of industrial grades of wire cloth, wire mesh conveyor belts, and Gripper Slings, maintains in addition to manufacturing facilities in Cambridge, Maryland, engineering and sales offices in Boston, New York, Baltimore, Pittsburgh, Detroit, Chicago, St. Louis, Atlanta, Houston and San Francisco.

Appointment of **KERMIT D. COLLOM** and **STANLEY E. JACKE** to the staff of the new Ultrasonics Division of the Detrex Corporation of Detroit, major manufacturer of industrial cleaning equipment and chemicals, has been announced by William F. Newberry, director of sales.

Mr. Collom will be in charge of sales, installation, and servicing of the new Detrex Soniclean machines which apply ultrasonic energy to precision metal cleaning. Mr. Jacke's duties will be devoted entirely to applied research in the ultrasonics field.

Stanley E. Jacke (left), Kermit D. Collom

Prior to joining Detrex, Mr. Collom was employed by the Weltronic Corp. of Detroit for nine years doing applied research in induction and dielectric heating. For four years he performed nondestructive testing experiments in General Electric's Lockland, Ohio, laboratories. A graduate of the University of Wisconsin, he has degrees in chemical and electrical engineering.

Mr. Jacke, a graduate of Purdue University in electrical engineering, was on the research staff of the Delco-Remy Division of General Motors for three years.

Detrex is the nation's first manufacturer to install a complete cleaning cycle with Sonic cleaning.

Wagner Brothers, Inc., 432 Midland Ave., Detroit manufacturer of electroplating and metal polishing equipment and supplies, has announced the appointment of **ROGER E. MARCE** to the sales and service staff. Mr. Marce will handle sales and service for the metropolitan Detroit district.

Roger E. Marce

Mr. Marce has a widely diversified knowledge of metal surface preparation as a result of 18 years of experience in this field. Most recently, he was a sales

engineer for the Grow Solvent Co., and technical director for the Neilson Chemical Co. Mr. Marce is a graduate of the Lawrence Institute of Technology, with a degree in Chemical Engineering.

David B. Stockton

L. J. George, Chicago district manager of the Udylite Corporation, announced the opening of a new warehouse in Rockford, Ill., to be under the direct supervision of **DAVID B. STOCKTON**, resident sales engineer.

The warehouse at 310 Market Street is amply stocked with metal plating and finishing suplies. The Rockford warehouse is the ninth to be opened in the corporation's nationwide expansion program.

DAVID REID, JR., has been appointed manager, Abrasive and Bond Plants, at Norton Company, Worcester, Mass., to replace **ALBERT E. HALL** who retired November 30. **ROBERT G. CLARKE**, who was assistant superintendent, succeeds Mr. Reid as superintendent, Abrasive and Bond Plants.

The J. C. Miller Company, finishing equipment and supply manufacturer of Grand Rapids, Michigan, has announced the appointment of **HEROLD R. GRUTTER** as sales and service representative for the company in the northern Ohio and southern Michigan territories. Mr. Grutter, who has had wide experience in the metal finishing field, will make his headquarters in Toledo, Ohio.

W. J. STODDARD has been named district supervisor in the Michigan district for the Metal Processing Department of Pennsylvania Salt Manufacturing Company, it has been announced by J. J. Duffy, Jr., sales manager. Mr. Stoddard will supervise sales and service activities in the Michigan area for Pennsalt metal cleaners, Fosbond phosphate coatings and Fos Process lubricants for cold working.

Mr. Stoddard has a background of 23 years' service with Pennsalt. Prior to joining the Metal Processing group as a sales-service engineer in 1941, he worked in the laboratory at Pennsalt's Wyandotte, Michigan, plant.

MEETINGS

The **CHICAGO BRANCH, A.E.S.,** will hold its **42ND ANNUAL EDUCATIONAL SESSION** on Saturday, January 30, 1954, at the Conrad Hilton Hotel.

Mr. Lloyd Gilbert of the Rock Island Arsenal will speak on "Alkaline Derusting as a Modern Plating Tool."

Dr. Allen G. Gray, Technical Editor of Steel Magazine, will speak on "What's Ahead in Plating."

Mr. Harry W. Howard of the Shell Chemical Corporation will speak on "Organic Finishes Based on Epon Resins."

Ed Stanek, Belke Mfg. Co., is Chairman of the Banquet Committee. The Banquet and Entertainment Program is scheduled for 7:00 P.M., following the Educational Program which will be given in the afternoon.

THE NATIONAL FEDERATION OF METAL FINISHERS will hold its first **MANAGEMENT SEMINAR** at the Conrad Hilton Hotel, Chicago, on Saturday, January 30, 1954.

Meeting concurrently with the Chicago Branch, American Electroplaters' Society, Annual Educational Session and Banquet, the job shop group will present an all-day program featuring top-flight speakers on a series of management topics.

Federation President Philip Ranno, Imperial Plating Co., Brooklyn, N. Y., has appointed J. Robert Greenwell, Chrome-Rite Co., Chicago, general conference chairman. The National Federation of Metal Finishers feels that management leaders in the metal finishing industry can profit through the free exchange of ideas, methods and techniques being applied in other industries.

Invitations have been sent to owners and operators of metal finishing job shops, as well as to managers of finishing departments in manufacturing establishments. Mr. Greenwell reported that this first seminar is being sponsor-

Philip Ranno, Chairman, National Federation of Metal Finishers

ed by the National Federation of Metal Finishers as a service to the industry, and that no admission fees will be charged.

The program for the four sesions of the seminar is as follows:

9:30 A.M.—"Work Simplification Programs for the Metal Finisher"—S. J. Fecht, President, S. J. Fecht & Associates, Management Consultants, Chicago.

10:30 A.M.—"Laying Out Production Lines for a Job Shop"—John B. Thornsen, Executive Assistant, Atwood Vacuum Machine Co., Rockford, Illinois.

2:30 P.M.—"Budgetary Controls for Small Business Establishments"—H. J. Hubenthal, President, Electran Mfg. Co., Chicago.

3:30 P.M.—"Organizing Your Business for Tax Advantages"—Max Becker, Max Becker & Company, Certified Public Accountants, Chicago.

Paul Glab, Northwestern Plating Works, Chicago, is Chairman of the Liaison Committee of the Chicago Branch, A.E.S., which is working with the National Federation in planning this first conference.

A second Management Seminar is being planned for July in New York City, during the 41st Annual A.E.S. Convention.

The **DAYTON BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY** will hold its **NINTH ANNUAL EDUCATIONAL SESSION AND DINNER-DANCE** on Saturday, Februarv 27, 1954 at the Dayton Biltmore Hotel.

The Educational Session, at 1:30 P.M. will feature the following speakers:

1. A. R. Burman, Cro-Plate Co., Inc., Hartford, Conn. Subject: "Pressure Wet Blasting."
2. R. O. Hull, R. O. Hull & Co., Inc., Rocky River, Ohio. Subject: To be announced.
3. J. C. Harris, assistant director of research, Central Research Dept., Monsanto Chemical Corp. Subject: "Tests for the Determination of Metal Cleanliness."

The Dinner Dance will be held at 7:00 P.M. Tickets are available at $6.50 per plate. For information regarding tickets or reservations contact R. L. Ruleff, 705 Hollendale Dr., Dayton 9, Ohio.

SOCIETIES

A new slant on the painting industry was presented recently to members of the **TOLEDO PAINT, VARNISH AND LACQUER ASSN.**, when Jorge Constantine, South and Central American representative of the DeVilbiss Company, spray painting equipment manufacturers, addressed the group.

He pointed out that competition between American paint products and those from Europe was keen because the European product is generally lower priced. Several American paint manufacturers have established plants in the South and Central American countries, Mr. Constantine reported. The quality of American finishing materials has enabled many of these companies to do a volume business in the Southern hemisphere.

Mr. Constantine told the group that it is essential to have sales literature for use in the South and Central American countries written in Spanish or Portuguese. This one point coupled with the service and instruction provided by American manufacturers, he added, will be an immense aid in merchandising the products.

Lee Watkins

LEE WATKINS, director of sales for the Almco Supersheen Division of Queen Works, Inc., and well known authority on barrel finishing was the principal speaker at the **UTICA, NEW YORK, CHAPTER OF THE AMERICAN SOCIETY OF TOOL ENGINEERS.** Mr. Watkins also gave an address in Syracuse, New York, to engineers and other personnel of the General Electric Corporation of that city.

Diagrams were used to show what action is obtained in a barrel finishing drum, and how it is controlled and varied

to get the many different superior results which are now being obtained with this process. Many recent developments and the resulting expanded field was explained, along with specific descriptions of many types of parts now being processed.

The seven basic operating conditions were thoroughly described. Mr. Watkins stated that by controlling these operating conditions almost all types of metal parts can be deburred, ground, polished, burnished or descaled. A complete description of the various medias and compounds was given, along with information as to how they should be used. Numerous examples were used and specific instructions on processing the various parts were given.

The **ANNUAL MEETING** of the **PHILADELPHIA BRANCH, A.E.S.,** was held November 21, at the Broadwood Hotel, Philadelphia. The Educational Session included talks on power for plating, effects of plating on various cathode forms, and plating solution difficulties, their prevention and cure.

Fig. 1—Don Volino, Maas & Waldstein Co., Educational Chairman for the Philadelphia Branch meeting, met with the speakers at a luncheon held prior to the Educational Session. Shown (left to right) are Milton Nadel; Dr. Ralph A. Schaefer; Don Volino; E. G. Schroeder; K. I. Clisby, and W. P. Rankin, both of K. I. Clisby & Associates; William H. Truesdell, First Vice President of the Philadelphia Branch.

Fig. 2—A.E.S. National Officers were on hand for the Philadelphia Branch meeting. Shown in the photo (left to right) are George Schore, General Chairman of the 1954 A.E.S. Convention to be held in New York City; Dr. Samuel Heiman, A.E.S. Third Vice President; P. Peter Kovatis, A.E.S. Executive Secretary; Clyde Kelly, A.E.S. Second Vice President; Dr. George P. Swift, A.E.S. President; Franklyn J. MacStoker, A.E.S. Past President; and Angelo Amatore, President of the New York Branch.

Fig. 3—Edwin F. Ottens, President of the Philadelphia Branch, opened the Educational Session, welcoming the members and guests to the meeting. Shown (left to right) are Dr. Ralph A. Schaefer, Milton Nadel, E. G. Schroeder, President Ottens, and William H. Truesdell.

Speaking on "The Application, Use and Maintenance of Motor-Generator Sets and Rectifiers for Electrolytic Processes," E. G. Schroeder, sales manager, The Electric Products Company, Cleveland, Ohio, pointed out that power is the core of all plating operations. Basing his discussion on a record of 130 case histories in small and large plating shops, he stressed the value of the utilization of power at the value for which the equipment was designed and specified. He pointed out also that loss of time due to power failure from unsatisfactory equipment was sometimes the result of the selection and purchase of equipment not designed and built to give satisfactory service, and represented an expensive "economy."

Dr. Ralph A. Schaefer, Director of Research, Cleveland Graphite Bronze Co., Cleveland, and First Vice President of the A.E.S., discussed, "Cathode Forms and Their Effect on Metal Distribution." This talk was illustrated by a large number of slides which illustrated the problem of securing proper current and metal distribution on cathodes of various shapes in a variety of different plating solutions and at various current densities. The information contained in his talk represented an enormous amount of research effort and is a valuable contribution to plating knowledge.

Milton Nadel, supervisor of metal finishing, Berkeley Industries, Jersey City, N. J., discussed "Defects in Plating Solutions and Their Remedies." Mr. Nadel stressed preparation of metal for plating and the importance of base metal cleanliness as well as the removal of impurities from plating solutions. Emphasizing the well-known fact that prevention of trouble is far cheaper than its cure, Mr. Nadel discussed a number of plating solutions and some of the common difficulties experienced with each. He then outlined several methods for overcoming or correcting the solution defects.

Fig. 4—Two old friends who renewed acquaintance at the Philadelphia Branch Annual Meeting were Albert Hirsch, honorary member of the Philadelphia Branch, and H. Leroy Beaver, consulting and contributing editor of PRODUCTS FINISHING.
(All photos by PRODUCTS FINISHING)

The **ANNUAL EDUCATIONAL SESSION** of the **DETROIT BRANCH, A.E.S.,** was held December 4 in the Hotel Statler. The entire program emphasized the research efforts of the American Electroplaters' Society and the importance of sustaining memberships in the Society which support the Research Program. Names of the sustaining member companies in the Detroit area were displayed on a large chart in the meeting room.

Fig. 1—Detroit Branch President L. C. Borchert, welcomed the 200-odd members and guests to the Annual Meeting.

L. C. Borchert, president of the Detroit Branch, welcomed the large group attending the meeting, after which Dr. William Blum served as Honorary Chairman of the Educational Session and also presented an interesting talk illustrated by color slides describing some of the places which he visited in Australia last February.

Dr. Earl J. Serfass of Lehigh University, reviewed the work and publications of the A.E.S. Research Program, mentioning in some detail a number of the more important aspects of the program.

Fig. 2—Acting as Honorary Chairman of the Educational Session, Dr. Blum, a long-time Chairman of the A.E.S. Research Committee, and active in research during his professional career, struck a humorous note in his talk by way of contrast with the more technical discussions of the other speakers.

Walter L. Pinner

Walter L. Pinner, Houdaille-Hershey Corporation, Director of A.E.S. Research Project No. 15, described the efforts of his group to develop by investigation an entirely new accelerated corrosion test. Mr. Pinner commented particularly upon the enthusiastic support which he has received from the members of his committee and the companies represented by these men. The project is unique in that it is not conducted at a college or university, it has no project director, no research fellow, and any expense incident to the operation of this project have been covered by the companies where the various committee members are employed.

Dr. A. E. R. Westman of the Ontario Research Foundation discussed "Metallographic Study of Some Steels Used for Nickel Plating," as developed in A.E.S.

Fig. 3—Dr. A. E. R. Westman of the Ontario Research Foundation, discussed the work of A.E.S. Project No. 14 as it applied to a study of base metal conditions encountered under electroplates.

Research Project No. 14. Of particular interest in Dr. Westman's presentation, were the color photographs of metallographic specimens which had been prepared by a technique known as taper polishing, so that a better picture of the area between the base metal surface and the electroplated coating could be presented visually.

Dr. Westman emphasized in his talk that to secure the best results from research efforts, it is essential to have the best equipment obtainable, and employ

Fig. 4—A partial view of the group attending the Detroit Branch Educational Session. (*All photos by PRODUCTS FINISHING*)

research people who are skillful and thoroughly trained in the proper use of the equipment.

The Detroit Branch Annual Party and Dinner Dance was held December 5. The Detroit Branch Annual Party traditionally is the largest of any of the Annual Parties given by branches of the Society.

TRAINING COURSES

THE DEVILBISS COMPANY, manufacturer of spray painting equipment, has established an equipment service school primarily for personnel who are

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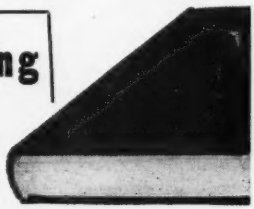

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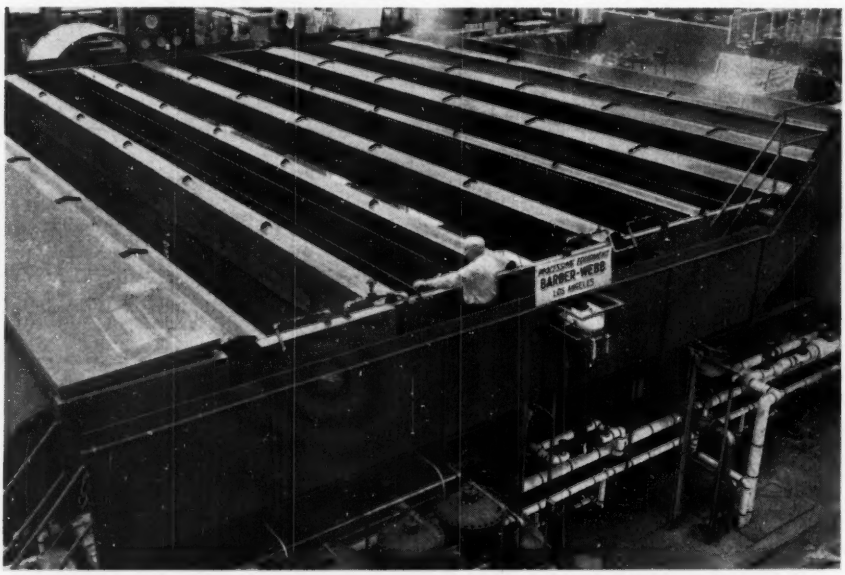
DeVilbiss equipment service school session.

engaged in servicing DeVilbiss products, **J. W. COCHRUN**, equipment service manager, has announced.

The school's curriculum includes courses in DeVilbiss spray painting equipment, function and operation of the equipment as well as advanced servicing techniques. **CURTIS R. PIPES** has been appointed supervisor of the program.

While movies, cutaways, and other training aids will be used in the school, Mr. Pipes said a great majority of the DeVilbiss products will be disassembled



Koroseal flexible material lines two of these giant metal processing tanks said to be the largest tanks of their type ever made on the West Coast. Installed at Lockheed Aircraft Corporation, Burbank, Calif., all bare metal aluminum and alloy parts pass through the tanks to receive acid treatment to prepare their surfaces for painting. According to The B. F. Goodrich Company, manufacturer of Koroseal, the flexible material has high resistance to certain strong corrosives which cannot be handled with rubber. Barber-Webb Company, Inc., Los Angeles, Calif., made and lined the tanks which measure 50 feet long, four feet wide and 11 feet deep. The Koroseal lining in one protects it from a solution of nitric and phosphoric acid at room temperature. The other tank holds Iridite No. 14 solution at 75 to 95 deg. Fahrenheit.

(Photo courtesy The B. F. Goodrich Co., Akron, Ohio)

and instruction given on repair and maintenance technique.

Present plans are to keep classes small, not exceeding seven persons, so maximum benefit can be gained from the instruction. While the actual spraying of paint with guns will be kept at a minimum, the students will be taught how to use spray patterns for checking gun performance.

Each student will receive a complete service manual and his name will be placed on the company's service literature mailing list.

Class schedules are being arranged and further information about the course may be obtained by writing to the Equipment Service Department, The DeVilbiss Company, 300 Phillips Ave., Toledo 1, Ohio. There is no cost for the class sessions, but the student arranges his own transportation, room and board.

meetings OF INTEREST TO FINISHERS

Jan. 23, 1954. Grand Rapids Branch, A.E.S., Eleventh Annual Educational Session, 1:30 P.M., Grand Rapids, Mich.

Jan. 30. Chicago Branch, A.E.S., 42nd Annual Educational Session and Banquet, Conrad Hilton Hotel, Chicago, Ill.

Jan. 30. National Federation of Metal Finishers, Management Seminar, Conrad Hilton Hotel, Chicago, Ill.

Feb. 13. Interim Meeting, A.E.S., 10:00 A.M., Royal York Hotel, Toronto, Ontario, Canada.

Feb. 27. Dayton Branch, A.E.S., Ninth Annual Educational Session and Dinner Dance, Dayton Biltmore Hotel, Dayton, Ohio.

Apr. 3. A.E.S. First Annual Tri-State Regional Meeting, Hotel Gibson, Cincinnati, Ohio. Sponsored by Cincinnati, Columbus, Dayton, Indianapolis, and Louisville Branches.

Apr. 21-24. Fourth International Conference on Electrodeposition and Metal Finishing, sponsored by **The International Council for Electrodeposition.** Hotel Russell, London, England.

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Jul. 12-15. 41st Annual Convention American Electroplaters' Society, Hotel Statler, New York City.

NECROLOGY

HERBERT D. TIETZ, manager of sales of the Inco Nickel Alloys Department of The International Nickel Company, Inc., died on October 11. He was 55.

Mr. Tietz was born in New York City. During World War I he served in the 27th Division of the 105th Field Artillery, F Battery of the United States Army. He had been associated with The International Nickel Company, Inc., since 1931. Mr. Tietz was a member of the New York Athletic Club.

IRVING BERKMAN, Treasurer of The Masters' Electro-Plating Association, died at the Montefiore Hospital in New York City on December 10, 1953. A native and resident of New York City,

Mr. Berkman learned the plating business by working in various departments of several New York City job shops. In 1930 with his brother Herman, he organized the job plating firm of Berkman Bros., Brooklyn, New York.

Mr. Berkman joined the Masters' Electro-Plating Association of New York City in 1935; his intense interest in the welfare of the plating industry and his sincere devotion to the Association soon resulted in his election to the Executive Committee. He served on the Committee variously as Chairman, Vice-Chairman, and Treasurer.

On October 27, Mr. Berkman was awarded the "Plating's Man of the Year" award.

NEW BOOKS

MODERN ELECTROPLATING. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York. Sponsored by The Electrochemical Society, edited by Dr. Allen G. Gray, Technical Editor, Steel Magazine, former Contributing Editor, PRODUCTS FINISHING Magazine. 563 pages, illustrated. $8.50.

The book consists of a one-volume summary of current industrial electroplating processes, emphasizing practical aspects of electroplating, as well as the basic theory.

Each metal is described in a separate chapter in which general principles, solution maintenance and control, basis metal preparation, and other factors are discussed.

The book also treats uncommon metals and the problems of plating on aluminum and magnesium.

REPORT ON SURFACE PREPARATION OF STEELS FOR ORGANIC AND OTHER PROTECTIVE COATINGS. Technical Practices Subcommittee 6-G of the **National Association of Corrosion Engineers** has published its second interim report dealing with methods of preparing steel surfaces for coatings. This report has been designated **PUBLICATION** 53-1 by NACE.

The report covers recommendations and explains methods whereby the surfaces of steel may be prepared for painting with organic and other coatings by means of weathering, wire brushing, grinding, flame conditioning, nozzle blast cleaning both wet and dry, wheel blasting, chemical pickling, electrolytic pickling, surface conditioning and numerous other related methods. Accepted standards are discussed and safety measures indicated.

Copies may be obtained from NACE, 1061 M & M Bldg., Houston 2, Texas, at $1 each or 5 or more copies 50 cents each.

ELECTRODEPOSITION RESEARCH. Proceedings of the NBS Semicentennial Symposium on Electrodeposition Research held at the NBS on December 4-6, 1951. National Bureau of Standards Circular 529, 129 pages, 38 figures, 19 tables, buckram bound, $1.50 (Order from Government Printing Office, Washington 25, D. C.)

Electrodeposition processes have become an integral and important part of many industries—for example, the printing, metal refining, extractive metallurgy, hardware, automobile, and electronic industries. This has come about largely as a result of extensive research in the field of electrodeposition, especially during the past 25 years. This volume contains the papers given at a symposium sponsored by NBS to encourage further research in this field, to present current research results and problems, and to facilitate the exchange of information.

Representing a cross section of research currently being conducted in electrodeposition by industrial, university, and government laboratories in Europe and the United States, the papers cover such topics as research on electrodeposition in Great Britain, the United States, France, Germany, Belgium, and Holland; electrodeposition research at Battelle Memorial Institute, United Chromium, Inc., the Bureau of Mines, Armour Research Foundation, Westinghouse Electric Corporation, and Sylvania Electric Products; research at Enthone, Inc., on metal finishing; brass plating; electroplating in the sleeve-bearing industry; corrosion resistance of copper, nickel and chromium-plated zinc, aluminum and magnesium base die castings; determination of impurities in electroplating baths; effects of impurities in plating solutions; porosity in deposits; correlation of gas permeability of electrodeposits with their weathering behavior; properties of electrodeposited nickel; disposal of cyanide wastes from plating operations; current and metal distribution in electrodeposition; and a new degreasing evaluation test; the atomizer test.

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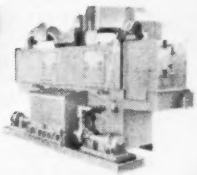

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